A1-F18AC-GAI-000

1 August 1995

Change 8 - 15 June 2001

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

GENERAL AIRCRAFT INFORMATION

NAVY MODEL

F/A-18A/B/C/D

161353 AND UP

THIS ISSUE INCLUDES INTERIM RAPID ACTION CHANGE 1

Published by Direction of the
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NATEC ELECTRONIC MANUAL

NUMERICAL INDEX OF EFFECTIVE WORK PACKAGES/PAGES

List of Current Changes

Original.....0.....1 Aug 95
Change.....1.....15 Jun 96
Change .....2 .....15 Mar 97
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Change .....7 .....1 Oct 00
Change .....8 .....15 Jun 01
(IRAC 1 Inc)

Only those work packages/pages assigned to the manual are listed in this index. Insert Change 8 dated 15 June 2001. Dispose of superseded work packages/pages. Superseded classified work packages/pages shall be destroyed in accordance with applicable security regulations. If changed pages are issued to a work package, insert the changed pages in the applicable work package. The portion of text affected in a change or revision is indicated by change bars or the change symbol "R" in the outer margin of each column of text. Changes to illustrations are indicated by pointing hands, change bars, or MAJOR CHANGE symbols. Changes to diagrams may be indicated by shaded borders.

Total number of pages in this manual is 152 consisting of the following:

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22	5
23	0
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26A	8
26B blank	8
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30A	1
30B blank	1
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31	0
32 blank	0

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ZNR UUUUU
R 231401Z OCT 01
FM BOEING ST LOUIS MO//JJJ//
TO COMNAVAIRSYSCOM PATUXENT RIVER MD//3.1/3.1.1/
4.4.3.2/3.1.1C/3-1.5R/3.3.1.1//
PEOTACAIR PATUXENT RIVER MD//PMA265/EOIR/3.1//
NATEC SAN DIEGO CA//3.3.A84//
COMNAVAIRLANT NORFOLK VA//N85N421/N421B//
COMNAVAIRPAC SAN DIEGO CA//N85/N421/N421B//
COMNAVRESFOR NEW ORLEANS LA//N42//
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COMMARFORPAC//ALD//
NAVAIRDEPOT JACKSONVILLE FL//F18AEOT/3.1.1/4.5//
AIG ONE SIX FIVE
COMSTRKFIGHTWINGPAC LEMOORE CA//N85//
COMSTRKFIGHTWINGLANT OCEANA VA//N85//
SFWSLANT OCEANA VA//N44//
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NAVAIRWARCENWPNDIV CHINA LAKE CA//331000D//
COMNAVAIRWARCENACDIV PATUXENT RIVER MD//JJJ//
NAVWEPTESTRON PT MUGU CA//JJJ//
NAVAIRDEPOT NORTH ISLAND CA//JJJ//
NAVAIRWPNSTA CHINA LAKE CA//JJJ//
CNATRA CORPUS CHRISTI TX//JJJ//
MAG THREE ONE//AMO//
RULSFAA/BOEING ST LOUIS MO//JOHN TAYLOR/S034-1615//
BT
UNCLAS //N13021//
MSGID/GENADMIN/BOEING ST LOUIS//
SUBJ/INTERIM RAPID ACTION CHANGE NO. 2 TO TECHNICAL
/MANUAL A1-F18AC-GAI-000, GENERAL AIRCRAFT INFORMATION
DATED 1 AUGUST 1995 WITH CHANGE 8 DATED 15 JUNE 2001.//
RMKS/ THIS IRAC REMAINS IN EFFECT UNTIL A MANUAL TITLE
PAGE INDICATES THIS IRAC HAS BEEN INCORPORATED.
1. RESPONSIBLE CODE: APPROVED BY NATEC, SAN DIEGO CA,
CODE 3.3A126.
2. PURPOSE OF CHANGE: TO ALLOW THE USE OF F404-GE-402 ENGINES
IN LOT 14 AIRCRAFT.
3. DETAILED INFORMATION: PEN AND INK CHANGES TO THE TECHNICAL
CONTENT OF A MANUAL ARE NOT AUTHORIZED. THE FOLLOWING TECHNICAL
CONTENT CHANGE INFORMATION APPLIES TO THE FOLLOWING REFERENCED
PAGES OF THE SUBJECT MANUAL UNTIL THE FORMAL CHANGE IS RELEASED.
A. IN WP 003 0, PAGE 1, PARA 2, CHANGE THE FOLLOWING:
"ON 164693 AND UP, THE AIRCRAFT IS POWERED BY TWO F404-GE-402
TURBOFAN ENGINES WITH AFTERBURNER. ON 164693 AND UP, IF SPECIFICALLY
DIRECTED BY TYCOM, TWO F404-GE-400 TURBOFAN ENGINES WITH AFTERBURNER
MAY BE USED." TO READ AS FOLLOWS: “ON 161353 THRU 164692,
THE AIRCRAFT IS POWERED BY TWO F404-GE-400 TURBOFAN ENGINES WITH
AFTERBURNER. IF SPECIFICALLY DIRECTED BY TYCOM, TWO F404-GE-400
TURBOFAN ENGINES WITH AFTERBURNER MAY BE USED ON 164693 AND UP.
ON 164693 AND UP, THE AIRCRAFT IS POWERED BY TWO F404-GE-402
TURBOFAN ENGINES WITH AFTERBURNER. IF SPECIFICALLY DIRECTED BY
TYCOM AND RAMEC NORIS-01-01, AFC. 350, MODIFICATION OF AIRCRAFT
WIRING FOR NO. 2 DIGITAL DATA COMPUTER IS INCORPORATED, TWO
F404-GE-402 TURBOFAN ENGINES WITH AFTERBURNERS MAY BE USED ON
164627 THRU 164692.”
4. VALIDATED BY D. B. DOMINGO, AERO ENGR 4.4.6 LOC:NADEP NORIS

TEL:DSN (619) 735-3432.
5. RELATED INSTRUCTIONS:
A. FOR PAPER COPY, MAINTAIN THIS IRAC WITH THE APPLICABLE MANUAL BY PLACING OR ATTACHING IT DIRECTLY BEHIND THE TITLE PAGE. MARK THE SPECIFIC CHANGE AREA IN THE MARGIN OF EACH PAGE AFFECTED WITH A VERTICAL LINE, AND INCLUDE THE IRAC NUMBER. THIS IRAC SHALL NOT BE REMOVED UNTIL RECEIPT OF THE FORMAL CHANGE PAGES.
B. FOR IRACS AFFECTING MANUALS ON CD-ROM, AFFIX AN ADHESIVE LABEL TO THE CD-ROM CASE, ANNOTATED WITH THE APPLICABLE PUBLICATION NUMBER, IRAC NUMBER AND DTG OF THE IRAC MESSAGE. THE LABEL SHOULD BE POSITIONED TO ALLOW FOR ADDITIONAL UPDATES AS THEY OCCUR. MAINTAIN THE IRAC ON FILE UNTIL RECEIPT OF THE SUPERSEDING CD-ROM.
C. THE DELIVERY DATE OF THE MANUAL INCORPORATING THIS CHANGE IS TBD.
6. NATEC POINT OF CONTACT IS KEVIN BRANGWYNNE, PHONE (619) 545-4769 OR E-MAIL BRANGWYNNEKP@NAVAIR.NAVY.MIL.
7. BOEING POINT OF CONTACT IS JOHN TAYLOR, PHONE (314) 233-4706 OR E-MAIL JOHN.L.TAYLOR@BOEING.COM.//
BT
#0007
NNNN

LIST OF TECHNICAL PUBLICATION DEFICIENCY REPORTS INCORPORATED

ORGANIZATIONAL MAINTENANCE

GENERAL AIRCRAFT INFORMATION

This WP supersedes TPDR WP, dated 1 October 2000.

1. The TPDRs listed below have been incorporated in this issue.

IDENTIFICATION NUMBER/ QA SEQUENCE NUMBER	LOCATION
NONE	

ALPHABETICAL INDEX

ORGANIZATIONAL MAINTENANCE

GENERAL AIRCRAFT INFORMATION

This WP supersedes WP001 00, dated 15 June 1996.

WORK PACKAGE INDEX

ORGANIZATIONAL MAINTENANCE

GENERAL AIRCRAFT INFORMATION

This WP supersedes WP001 01, dated 1 August 1995.

INTRODUCTION

ORGANIZATIONAL MAINTENANCE

GENERAL AIRCRAFT INFORMATION

This WP supersedes WP002 00, dated 15 March 1997.

1. PURPOSE.

2. This manual provides general information for Navy F/A-18 aircraft, made up of: aircraft description aircraft arrangement danger areas and precautionary measures system description.

3. REQUISITION AND AUTOMATIC DISTRIBUTION OF NAVAIR TECHNICAL MANUALS.

4. Procedures to be used by Naval activities and other Department of Defense activities requiring NAVAIR technical manuals are defined in NAVAIR 00-25-100 and NAVAIRINST 5605.5.4A.

5. To automatically receive future changes and revisions to NAVAIR technical manuals, an activity must be established on the Automatic Distribution Requirements List (ADRL) maintained by the Naval Air Technical Data and Engineering Service Command (NATEC). To become established on the ADRL, notify your activity central technical publications librarian. If your activity does not have a library, you may establish your automatic distribution by contacting the Commanding Officer, NATEC, Attn: Distribution, NAS North Island, Bldg. 90, P.O. Box 357031, San Diego CA 92135-7031. Annual reconfirmation of these requirements is necessary to remain on automatic distribution. Please use your NATEC assigned account number whenever referring to automatic distribution requirements.

6. If additional or replacement copies of this manual are required with no attendant changes in the ADRL, they may be ordered by submitting a MILSTRIP requisition in accordance with NAVSUP 485 to Routing Identifier Code "NFZ". MILSTRIP requisitions can be submitted through your supply office, Navy message, or SALTS to DAAS (Defense Automated Address System), or through the DAAS or NAVSUP web sites. For assistance with a MILSTRIP requisition, contact the Naval Inventory Control Point (NAVICP) Publications and Forms Customer Service at DSN 442-2626 or (215) 697-2626, Monday through Friday, 0700 to 1600 Eastern Time.

7. WORK PACKAGES.

8. Work packages are complete sets of data or procedures.

9. Each work package is identified by Arabic numbers, starting with the number 001 00. Work package numbers are used for referencing within manuals. Manual numbers and work package numbers are used for referencing between manuals.

10. The first work package in a manual is WP001 00, the alphabetical index. Second and subsequent work packages are numbered WP001 01 through WP999 99 as required. The introduction work package is always WP002 00. Generally WP003 00 through WP999 99 are technical content work packages.

11. REFERENCE MATERIAL LIST.

12. The reference material list in each work package contains the titles and numbers of technical manuals supporting the data or procedures in a work package.

13. MANUAL ISSUE DATE.

14. The date on the title page is the copy freeze date. No additions, deletions, or changes are made after the manual issue date except last minute safety of flight or required maintenance changes. Data collected after the manual issue date will be included in later changes or revisions of the manual.

15. ALPHABETICAL INDEX.

16. The manual alphabetical index, work package 001 00, lists work packages and major subjects within the manual. Each work package also has an alphabetical index listing the subjects of the work package and specific page numbers.

17. EFFECTIVITIES.

18. Effectivity notes on manual title pages, work package title pages, and within a work package indicate the aircraft or software program to which the data applies. If no effectivity note appears on the work package title page, the work package has the same effectivity as shown on the manual title page. The effectivity notes may use:

a. Type, model, and series

NOTE

F/A-18D aircraft after bureau number 164967 was referred to as bureau number F/A-18D D-140. Now, F/A-18D aircraft after bureau number 164967 is 165409.

b. Bureau number (tail number)

c. Combination of type, model, series, and bureau numbers

d. Part number or serial number

e. Technical directive number

f. Configuration/identification number

19. The table below shows examples of effectivity notes and their meanings:

Effectivity Note Examples

Effectivity Note	Definition
160777 AND UP	Applicable to all F/A-18A, F/A-18B, F/A-18C and F/A-18D for bureau numbers listed.
F/A-18A, F/A-18B	Applicable to all F/A-18A and F/A-18B.
F/A-18C, F/A-18D	Applicable to all F/A-18C and F/A-18D.
F/A-18A	Applicable to all F/A-18A, but not F/A-18B, F/A-18C and F/A-18D.
F/A-18B	Applicable to all F/A-18B, but not F/A-18A, F/A-18C, and F/A-18D.
F/A-18C	Applicable to all F/A-18C, but not F/A-18A, F/A-18B, and F/A-18D.
F/A-18D	Applicable to all F/A-18D, but not F/A-18A, F/A-18B, and F/A-18C.
F/A-18A, F/A-18C	Applicable to all F/A-18A and F/A-18C, but not to F/A-18B and F/A-18D.
F/A-18B, F/A-18D	Applicable to all F/A-18B and F/A-18D, but not to F/A-18A and F/A-18C.
F/A-18A 160775, 160777 THRU 160782	Only applicable to some bureau numbers of F/A-18A. Not applicable to any F/A-18B, even if a F/A-18B bureau number is within the numbers listed.

Effectivity Note Examples (Continued)

Effectivity Note	Definition
F/A-18C 163427, 163430 THRU 163456	Only applicable to some bureau numbers of F/A-18C. Not applicable to any F/A-18D, even if a F/A-18D bureau number is within the numbers listed.
F/A-18B 160784 AND UP	Only applicable to some bureau numbers of F/A-18B. Not applicable to any F/A-18A, even if an F/A-18A bureau number is within the numbers listed.
F/A-18D 163434 THRU 163457	Only applicable to some bureau numbers of F/A-18D. Not applicable to any F/A-18C, even if a F/A-18C bureau number is within the numbers listed.
F/A-18B 160784 AND UP, F/A-18D	Applicable to some bureau numbers of F/A-18B. Not applicable to any F/A-18A, even if an F/A-18A bureau number is within the numbers listed. Also applicable to all F/A-18D aircraft.
F/A-18C, F/A-18D 163434 THRU 163457	Applicable to all F/A-18C aircraft. Applicable to some bureau numbers of F/A-18D.
F/A-18D D-140 AND UP OR F/A-18D 165409 AND UP	Applicable to all F/A-18D aircraft after bureau number 164967.
160775 THRU 160785 BEFORE F/A-18 AFC 772	Applicable to F/A-18A and F/A-18B for bureau numbers listed, before modification by technical directive.
161213 AND UP; ALSO 160775 THRU 160785 AFTER F/A-18 AFC 772	Applicable to aircraft modified during production; also applicable when affected aircraft have been modified by technical directive.
160775 THRU 160785; WHEN NO. 2 CONTROL PANEL P/N XXXX-X IS INSTALLED	Applicable to F/A-18A and F/A-18B for bureau numbers listed if panel P/N XXXX-X is installed. (Configuration before AVC)
161213 AND UP; ALSO 160775 THRU160785; WHEN NO. 2 CONTROL-PANEL P/N XXXX-Y (AVC-102) IS INSTALLED	Applicable to aircraft modified during production; also applicable to aircraft components modified to the production configuration by technical directive. (Configuration after AVC)
P/N MBEU65101-9, MBEU65101-10 & MBEU65105-3	Applicable to assemblies which are interchangeable between aircraft.
ENGINE NO. 215101 THRU 215109	Applicable to assemblies which are interchangeable between aircraft, but configurations can not be identified by part number.
CONFIG/IDENT NUMBER 84A	The CONFIG/IDENT Number is the program load identification number which identifies the software program loaded in specific programmable units. Refer to A1-F18AC-SCM-000 for CONFIG/IDENT Number tables.

20. TECHNICAL DIRECTIVES.

21. Technical directives are documents which provide instructions to incorporate and record retrofit configuration modifications or inspection instructions to delivered aircraft, or aircraft components.

22. **AIRFRAME CHANGE (AFC) AND AIRBORNE SOFTWARE CHANGE (ASC).** Technical directives which change configuration of aircraft structure or equipment installation, i.e. AFC, will list aircraft bureau numbers in effectivity notes and show before and after the AFC. Technical directives which change configuration of operational flight programs (OFP), i.e. ASC, will list the OFP CONFIG/IDENT NUMBER in effectivity notes and show the latest two authorized OFP programs. See AFC and ASC effectivity examples in Effectivity Note Example Table.

23. **AIRCRAFT COMPONENT CHANGES.** Technical directives which change configuration of aircraft components are listed below:

AAC	Aviation Armament Change for armament equipment
ACC	Aircrew System Change for aircrew survival equipment
AFC	Airframe Change for aircraft structure and equipment
ASC	Airborne Software Change for operational flight programs
AVC	Avionics Change for airborne electronic equipment, including wiring changes
AYC	Accessory Change for mechanical system
PPC	Power Plant Change for engines

24. Component changes will list part numbers in the effectivities. See AVC effectivity examples in Effectivity Note Example table.

25. RECORD OF APPLICABLE TECHNICAL DIRECTIVES.

26. The technical directives affecting this manual are listed in the Record of Applicable Technical Directives of each affected work package. Because an ASC directs all aircraft be modified within 30 days, ASC's are not listed. When all affected aircraft are modified, the before configuration is removed from the manual, and the technical directive entry is removed from the Record of Applicable Technical Directives.

27. WARNINGS, CAUTIONS, AND NOTES.

28. Items of special importance and critical information are identified in warnings, cautions, and notes. Warnings and cautions appear immediately before the step to which they apply. Notes may appear before or after the affected step.

WARNING

Warnings describe conditions or procedures that could result in injury or death if correct procedures are not followed.

CAUTION

Cautions describe conditions or procedures that could result in damage to or destruction of equipment if correct procedures are not followed.

NOTE

Notes describe or clarify conditions or procedures.

29. REFERENCE DESIGNATIONS.

30. Reference designations are code numbers assigned to electronic, electrical and mechanical parts in Organizational Maintenance Manuals which have illustrated parts breakdown. Reference designations are used to aid in identifying and locating components in the technical manuals. Schematics in the principles of operation manual and the system schematics manual show reference designations for components. Reference designations are printed, stamped, or identified on most electrical and electronic components on the aircraft.

31. Reference designations can be used to find several types of data. A numerical index of reference designations in the Parts List Index, A1-F18AC-IPB-450, can be used to find part numbers and to locate specific maintenance instructions for identified components. Numerical indexes of electrical connectors are included in the

Wiring Diagram Manuals, A1-F18A( )-WDM-000, and in the Wiring Repair Manual, A1-F18A( )-WRM-000. These indexes are the key to locating the required wiring diagram/bundle data and connector parts data.

32. TECHNICAL PUBLICATIONS DEFICIENCY REPORT (TPDR).

33. The TPDR (OPNAV FORM 4790/66) is the form for reporting errors and suspected omissions in the technical manuals. The TPDR WP lists the TPDRs that are incorporated in the current issue of the manual.

34. TPDR reporting procedures are in OPNAVINST 4790.2 SERIES.

35. QUALITY ASSURANCE PROCEDURES.

36. Procedures or parts of procedures which require quality assurance inspection are identified by the letters (QA) after the applicable steps. When (QA) is assigned to a step or a heading which is immediately followed by substeps, the inspection requirement is applicable to all substeps.

37. When doing maintenance in any area, a visual inspection of the area will be made for cracks, corrosion and security of component installation before securing the area for flight.

38. NAVY (AN) STANDARD/COMMON NAME NOMENCLATURE.

39. When an item has both Navy (AN) standard and common name nomenclature assigned, the common name nomenclature will be used in text and on illustrations. Full Navy (AN) standard nomenclature will be used in the Illustrated Parts Breakdown (IPB).

40. ORGANIZATIONAL MAINTENANCE TECHNICAL MANUALS.

41. **AIRCRAFT TECHNICAL MANUAL LIST, A1-F18AC-AML-000.** This manual provides a list of all the technical manuals applicable to the F/A-18A and F/A-18B, F/A-18C and F/A-18D aircraft.

42. **CROSS SERVICING GUIDE, A1-F18AC-CSS-000.** This manual contains information for servicing the F/A-18A, F/A-18B, F/A-18C and F/A-18D. The data includes safe handling, launch and recovery information, refueling and replenishment data, inspections, armament and servicing while away from home base.

43. **FAULT ISOLATION MANUAL, A1-F18AC-FIM-000.** This manual has troubleshooting data to isolate operational malfunctions to a defective aircraft component or wiring. Procedures are limited to malfunctions identified in the fault reporting manual that require specific fault isolation procedures to determine the cause.

44. **FAULT ISOLATION MANUAL, MEMORY INSPECT ACCESS, A1-F18AC-FIM-100.** This manual provides procedures and tables for memory inspection of the Digital Data Computers no. 1 & 2. Data is provided in tabular form to access and analyze the information contained in the computer memory locations.

45. **FAULT REPORTING MANUAL, A1-F18A( )-FRM-000.** This manual lists operational malfunctions reported by pilots and maintenance personnel. The data is made up of specific fault indications, related conditions, and other pertinent data which aids or directs personnel to specific maintenance actions that correct the malfunction.

46. **GENERAL AIRCRAFT INFORMATION, A1-F18AC-GAI-000.** This manual provides general information for Navy models F/A-18A, F/A-18B, F/A-18C, and F/A-18D aircraft, made up of:

aircraft description
aircraft arrangement
danger areas and precautionary measures
system description

47. **LINE MAINTENANCE ACCESS DOORS, A1-F18AC-LMM-010.** This manual has data required by line maintenance personnel for opening and closing doors and removing and installing covers.

48. **LINE MAINTENANCE BORESIGHTING DATA, A1-F18AC-LMM-040.** This manual has data required by maintenance personnel for boresighting the Inertial Navigation System, Head-Up Display Unit, Radar Antenna, 20 MM gun system, forward looking infrared system, and laser detector tracker system.

49. **LINE MAINTENANCE CONDITIONAL INSPECTION PROCEDURES, A1-F18AC-LMM-030.**

This manual has conditional inspection procedures for use by line maintenance personnel.

50. **LINE MAINTENANCE EMERGENCY PROCEDURES, A1-F18AC-LMM-020.** This manual has data required by line maintenance personnel for handling emergencies.

51. **LINE MAINTENANCE PROCEDURES, A1-F18AC-LMM-000.** This manual has data required by line maintenance personnel for doing tasks that are repeated often on the aircraft, for example:

- nose wheelwell digital display indicator operation
- cockpit digital display indicator setup for displays
- electrical and hydraulic power application and removal
- external ground cooling air application and removal
- ground intercommunications hookup
- utility (electrical) power, circuit breaker, and relay locations
- boarding ladder and canopy operation
- windshield opening and closing
- APU and engine operating instructions
- radome opening and closing
- main and nose landing gear wheel and tire assemblies removal, installation and inspection
- electrical bonding, sealing, and electromagnetic compatibility (EMC) protection
- exterior drains and vents
- allowable leaks limits
- liquid oxygen converter exchange
- main and nose landing gear servicing
- specific component servicing

52. **LINE MAINTENANCE CONFIGURATION MANUAL, A1-F18AG-LMM-050.** This manual has data required by maintenance personnel for aircraft configuration conversion.

53. **PARTS LIST INDEX MANUAL, A1-F18AC-IPB-450.** This manual has a numerical index of part numbers and a reference designation index for use with aircraft organizational maintenance manuals. When reference designations or part numbers are known, the index locates specific maintenance instructions and parts data.

54. **PERIODIC MAINTENANCE INFORMATION CARD, A1-F18A( )-MRC-000.** This manual contains information to assure timely maintenance of the weapons system. The data listed on the equipment has an approved removal/replacement interval and a reference to the appropriate directive.

55. **TURNAROUND CHECKLIST, A1-F18A( )-MRC-100.** This checklist contains abbreviated inspection requirements to ensure the integrity of aircraft for flight and determine the need for servicing. The maintenance tasks will be done between flights.

56. **DAILY/SPECIAL CONDITION MAINTENANCE REQUIREMENTS CARDS, A1-F18A( )-MRC-200.** This manual contains the minimum daily maintenance requirements.

57. **SPECIAL/PRESERVATION MAINTENANCE REQUIREMENT CARDS, A1-F18A( )-MRC-250.** This manual contains the minimum special, preservation and if applicable, conditional requirements.

58. **PHASED MAINTENANCE REQUIREMENTS CARDS, A1-F18A( )-MRC-300.** This manual contains requirements for inspection for material degradation and preventive maintenance. The data includes clearances, pressures, tolerances, illustrations, equipment required, manual references and inspection intervals.

59. **PIPING INSTALLATION MANUAL, A1-F18AC-PIM-000 SERIES.** This manual has work packages arranged by access areas showing all fluid and pneumatic lines (pipes) in that area with parts data. Typical piping removal, installation, and repair data is included.

60. **PLANE CAPTAIN MANUAL, A1-F18AC-PCM-000.** This manual has data required by the plane captain for doing tasks that are repeated often, for example:

- tie-down
- electrical (static) grounding
- solo flight stowage of rear ejection seat equipment (F/A-18B)
- test - fluids low maintenance codes
- general servicing information
- canopy and windshield cleaning, defrosting, deicing, and rain repellent application
- refuel/defuel

specific component servicing/draining
Naval joint oil analysis program (JOAP) sampling
engine ferrograph
wing folding
battery charging
ground protective/safety devices

61. **SOFTWARE CONFIGURATION MANUAL, A1-F18AC-SCM-000.** This manual provides the information required to identify airframe equipment programs, and defines corresponding aircraft configurations compatible with these programs.

62. **SOFTWARE GENERATED FUNCTIONS, A1-F18AE-SGF-000.** This manual describes functions provided by the aircraft mission computer operational flight program (OFP) when no system weapon replaceable assembly (WRA) exists (software only system).

63. **QUICK REFERENCE MANUAL, A1-F18AC-570-600.** This manual provides troubleshooting guidance for flight control system (FCS) related cautions and built-in test logic inspection (BLIN) codes. Tables within control surface specific work packages numerically list all FCS associated BLIN codes and appropriate maintenance actions.

64. **STRUCTURAL REPAIR, A1-F18A( )-SRM-( ) SERIES.** These manuals have procedures for corrosion control, and for removing, cleaning, inspecting, and repairing structural components. IPB data and inspections are included in the data.

65. **PRINCIPLES OF OPERATION, A1-F18A( )-( )-100 SERIES.** These manuals have functional descriptions of the aircraft systems, component location illustrations, and simplified system schematics or block diagrams.

66. **SYSTEM TESTING AND TROUBELSHOOTING, A1-F18A( )-( )-200 SERIES.** These manuals have procedures to ground test and evaluate aircraft systems and subsystems. When test results are not correct, troubleshooting data identifies the cause of the malfunction.

67. **SYSTEM MAINTENANCE WITH IPB, A1-F18A( )-( )-300 SERIES.** These manuals have procedures for removing, cleaning, inspecting, repairing, installing, aligning, and adjusting all components of the system or equipment with approved special tools and test equipment. An illustrated parts breakdown supports each procedure. Extreme environmental maintenance data is provided where applicable.

68. **SYSTEM SCHEMATICS, A1-F18A( )-( )-500 SERIES.** These manuals have mechanical, pneudraulic, electrical, and avionic system schematics. The schematics support maintenance procedures contained in other organizational maintenance manuals.

69. **WEAPONS/STORES LOADING, A1-F18A( )-LWS-000.** This manual provides data required by weapon loading personnel for handling, inspection, fuzing, loading, and unloading of airborne weapons/stores.

70. **WIRING DIAGRAMS, A1-F18A( )-WDM-000 SERIES.** These manuals have data for isolating an aircraft wiring problem to a specific connector or wire segment. Locator drawings have bundle routing, electrical component location, and parts data.

71. **WIRING REPAIR, A1-F18A( )-WRM-( ) SERIES.** These manuals have tooling and wiring information, wire bundle repair procedures, and parts data.

72. **WORKAROUND PROCEDURES MANUAL, A1-F18AC-WAP-000.** This manual identifies workaround GSE and procedures that are to be used when the approved GSE has not been provided.

73. **WORK UNIT CODE MANUAL, A1-F18AC-WUC-800.** This manual identifies codes used for recording maintenance data in a manner that will be adaptable to accounting machine processing. These codes are used to produce reports for use in the management and improvement of the maintenance, material supply, and equipment design function.

74. **SYSTEM ORGANIZATIONAL MAINTENANCE MANUALS.** The list below contains the publication numbers and titles of manuals which provide organizational maintenance data, by system.

Principles of Operation A1-F18A( )	Testing and Troubleshooting A1-F18A( )	System Maintenance With IPB A1-F18A( )	System Schematics A1-F18A( )	System Title
-120-100	-120-200	-120-300	-120-500	Seat, Canopy, Survival Equipment, and Boarding Ladder
		-120-310		Aircraft Ejection Seat SJU-5/A and SJU-6/A (Shop Maintenance)
		-120-600		Aircraft Ejection Seat - SJU-5/A and SJU-6/A or SJU-17(V)1/A and SJU-17(V)2/A Removal/Dearming - By Disassembly; Arming/Installation - By Assembly
		-120-650		Aircraft Ejection Seat - SJU-5/A and SJU-6/A or SJU-17(V)1/A and SJU-17(V)2/A Removal/Dearming - As A Unit; Arming/Installation - As A Unit
		-120-700		Aircraft Seat Oxygen Survival Kit - SKU-3/A or SKU-10/A and Ejection Seat Bucket
-130-100	-130-200	-130-300 -130-310 -130-320	-130-500	Landing Gear and Related Systems
-240-100	-240-200	-240-300	-240-500	Secondary Power System
-270-100	-270-200 -270-210	-270-300 -270-310	-270-500	Power Plant and Related Systems
-410-100	-410-200	-410-300 -410-310	-410-500	Environmental Control Systems
-420-100	-420-200	-420-300 -420-310	-420-500	Electrical System
-440-100	-440-200	-440-300	-440-500	Lighting System
-450-100	-450-200	-450-300	-450-500	Hydraulic System

Principles of Operation A1-F18A( )	Testing and Troubleshooting A1-F18A( )	System Maintenance With IPB A1-F18A( )	System Schematics A1-F18A( )	System Title
-460-100	-460-200 -460-210	-460-300 -460-310 -460-320 -460-330	-460-500	Fuel System
-510-100	-510-200	-510-300	-510-500	Instrument Systems
-560-100	-560-200	-560-300	-560-500	Air Data Computer System
-570-100	-570-200 -570-210 -570-220 -570-250	-570-300 -570-310	-570-500 -570-510	Integrated Flight Controls
-580-100	-580-200	-580-300	-580-500	Maintenance Status Display and Recording System or Flight Incident Recorder and Monitoring System
-600-100	-600-200	-600-300	-600-500	Communication, TACAN, ADF, Electronic Altimeter, and IFF Systems
-630-100 -630-110/(C)	-630-200	-630-300	-630-500 -630-510/(C)	Data Link, Instrument Landing, and Radar Beacon Systems
-710-100	-710-200	-710-300	-710-500	Global Positioning System
-730-100	-730-200	-730-300	-730-500	Inertial Navigation, and Backup Attitude and Navigation Systems
-731-100	-731-200	-731-300	-731-500	Digital Map Set AN/ASQ-196
-740-100 -740-110	-740-200 -740-210 -740-220 -740-230 -740-250/(C)	-740-300	-740-500 -740-510 -740-520	Weapon Control System
-741-100 -741-110 -741-120	-741-200	-741-300	-741-500	Mission Computer System
-742-100 -742-150/(C)	-742-200	-742-300	-742-500 -742-500/(C)	Radar System
-742-150/(C)			-742-550/(C)	

Principles of Operation A1-F18A( )	Testing and Troubleshooting A1-F18A( )	System Maintenance With IPB A1-F18A( )	System Schematics A1-F18A( )	System Title
-743-100	-743-200	-743-300	-743-500	Laser Detector Tracker System
-744-100	-744-200	-744-300	-744-500	Forward Looking Infrared System
-745-100	-745-200	-745-300	-745-500	Multipurpose Display Group
-746-100	-746-200	-746-300	-746-500	Navigation Infrared Receiving System
-750-100	-750-200	-750-300	-750-500	Gun System
-760-100	-760-200	-760-300	-760-500	Tactical Electronic Warfare Systems
-770-100	-770-200	-770-300	-770-500	Photographic System

ORGANIZATIONAL MAINTENANCE

AIRCRAFT DESCRIPTION

This WP supersedes WP003 00, dated 1 August 1995.

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

SEE IRAC # 2

1. GENERAL INFORMATION.

2. **DESCRIPTION.** The F/A-18A and F/A-18C are one crew member aircraft. The F/A-18B and F/A-18D are two crew member versions of the F/A-18A and F/A-18C. ON 161353 THRU 164692, the aircraft is powered by two F404-GE-400 turbofan engines with afterburner. On 164693 AND UP, the aircraft is powered by two F404-GE-402 turbofan engines with afterburner. On 164693 AND UP, if specifically directed by TYCOM, two F404-GE-400 turbofan engines with afterburner may be used. The aircraft has a variable camber mid wing with leading edge extensions. The two vertical stabilizers are angled outboard 20° from vertical. The wings have a leading and trailing edge flap system to provide the desired aircraft performance and stability characteristics. The dual rudder and rudder actuator system provides directional control during flight.

3. The auxiliary power unit (APU) and airframe mounted accessory drive (AMAD) provide on-board power for engine starting, electrical system operation, hydraulic system operation, and fuel system operation. In addition, the APU provides air to the environmental control systems during ground testing.

4. **MISSION.** The F/A-18A/B/C/D is designed for Air-To-Air (A/A) and Air-To-Ground (A/G) weapon delivery. A/A and A/G stores can be loaded on the nine weapon stations shown in WP004 00.

Armament also includes the M61A1 or M61A2 20MM automatic gun system. Store capability includes conventional capabilities. Mission range may be extended by loading three external fuel tanks on the pylons for weapon stations 3, 5, and 7.

5. **DIMENSIONS.** See figure 1.

6. External dimensions of the F/A-18A, F/A-18B, F/A-18C AND F/A-18D are the same except for the canopy height.

7. **AIRCRAFT COORDINATES.** See figure 2.

8. X, Y, and Z coordinates are measured in inches and are used as the basic aircraft coordinate system.

9. **X COORDINATES.** Lines used to indicate vertical planes dividing the aircraft from wing tip to wing tip are called X coordinates. X coordinate (X0.00) is the vertical plane of the aircraft symmetry. Negative X coordinates (–X) are vertical planes to the right of X0.00. Positive X coordinates (X) are vertical planes to the left of X0.00.

10. **Y COORDINATES.** Lines used to indicate the longitudinal planes dividing the aircraft from nose to tail are called Y coordinates. Y000.00 is 60.50 inches in front of the radome nose.

11. **Z COORDINATES.** Lines used to indicate horizontal planes dividing the aircraft parallel to an arbitrary reference plane to ground level and to tail tip are called Z coordinates.

12. **MATERIALS DISTRIBUTION.** See figure 3.

13. The airframe is primarily made of aluminum. Graphite/epoxy composite is used for many skins and doors. Titanium is also used for skins and doors. Where maximum strength is required, beta annealed bar, plate, and forgings are used. High strength steel is used in the landing and arresting gear. Hydraulic tube assemblies are titanium.

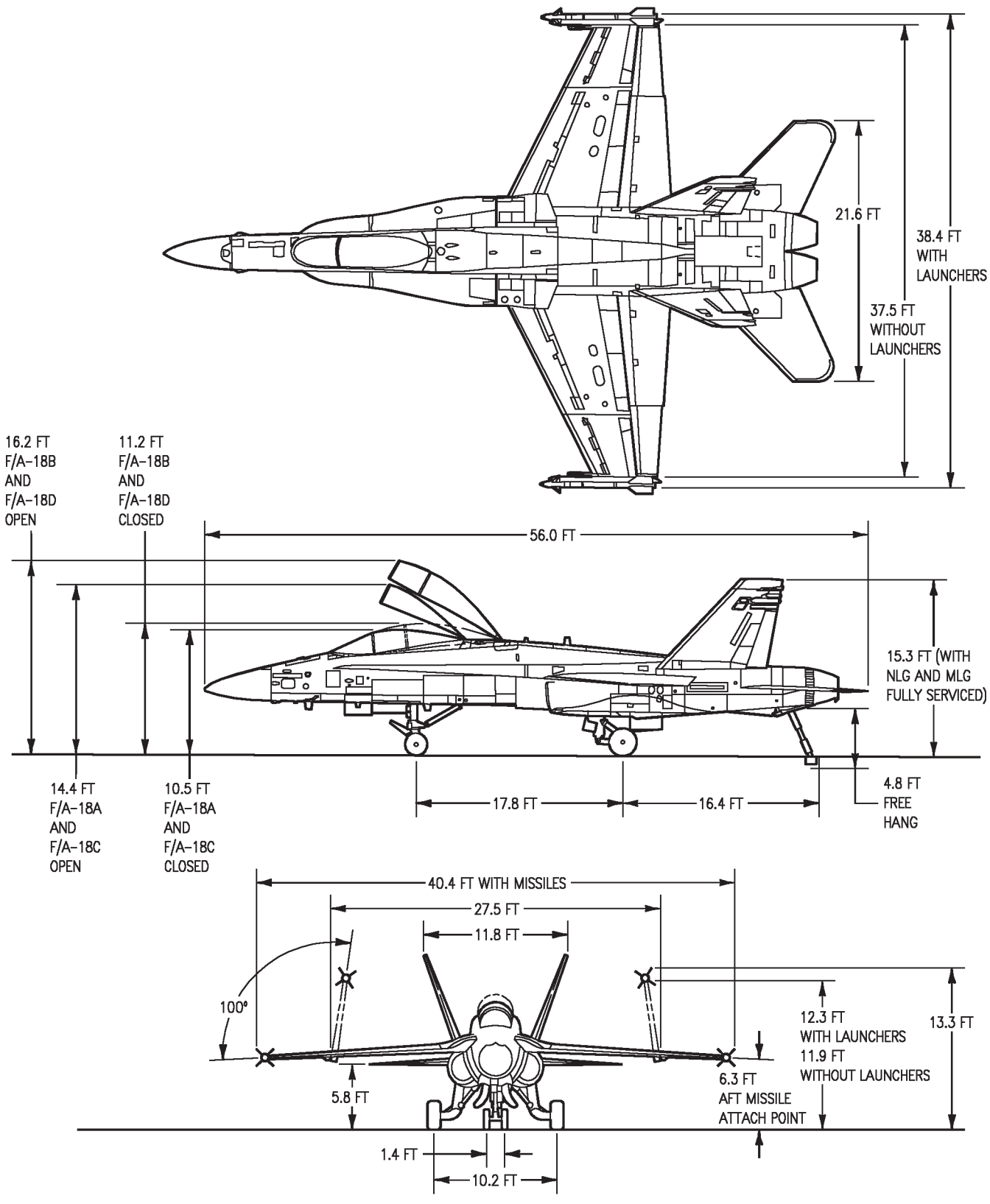
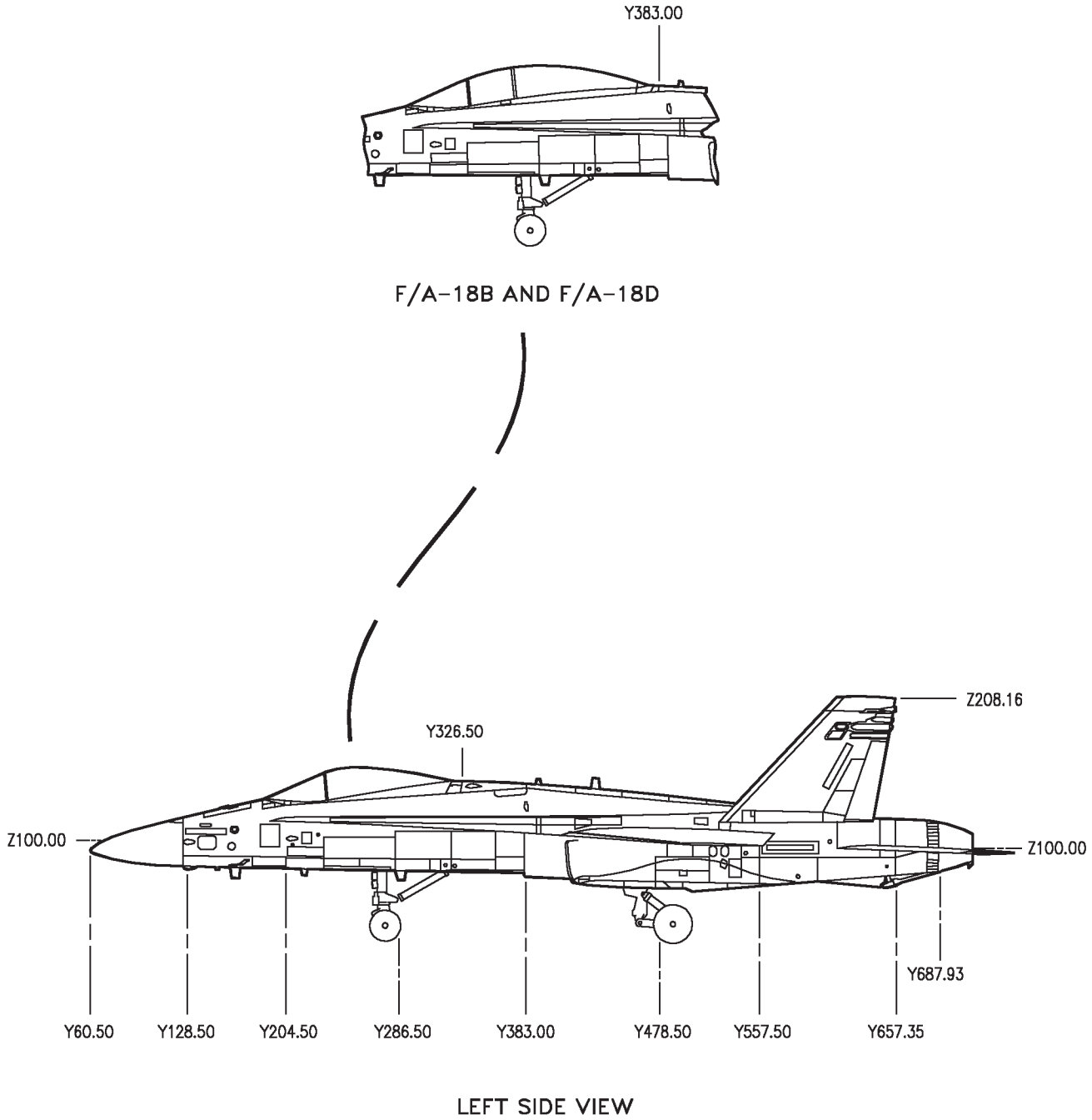


Figure 1. Aircraft Principle Dimensions



18AC-GAI-00-(1-1)16-CATI

Figure 2. Aircraft Coordinates (Sheet 1)

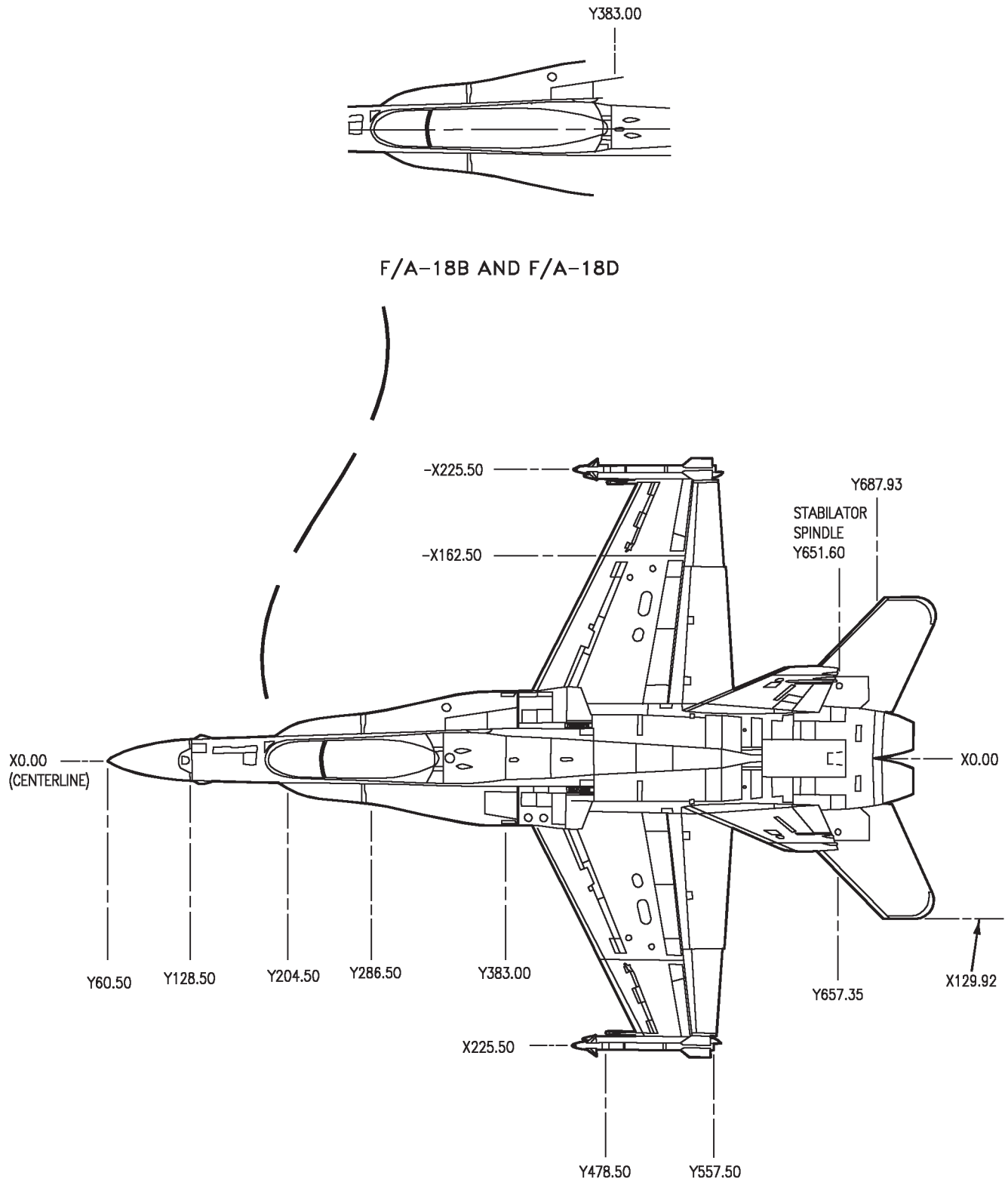
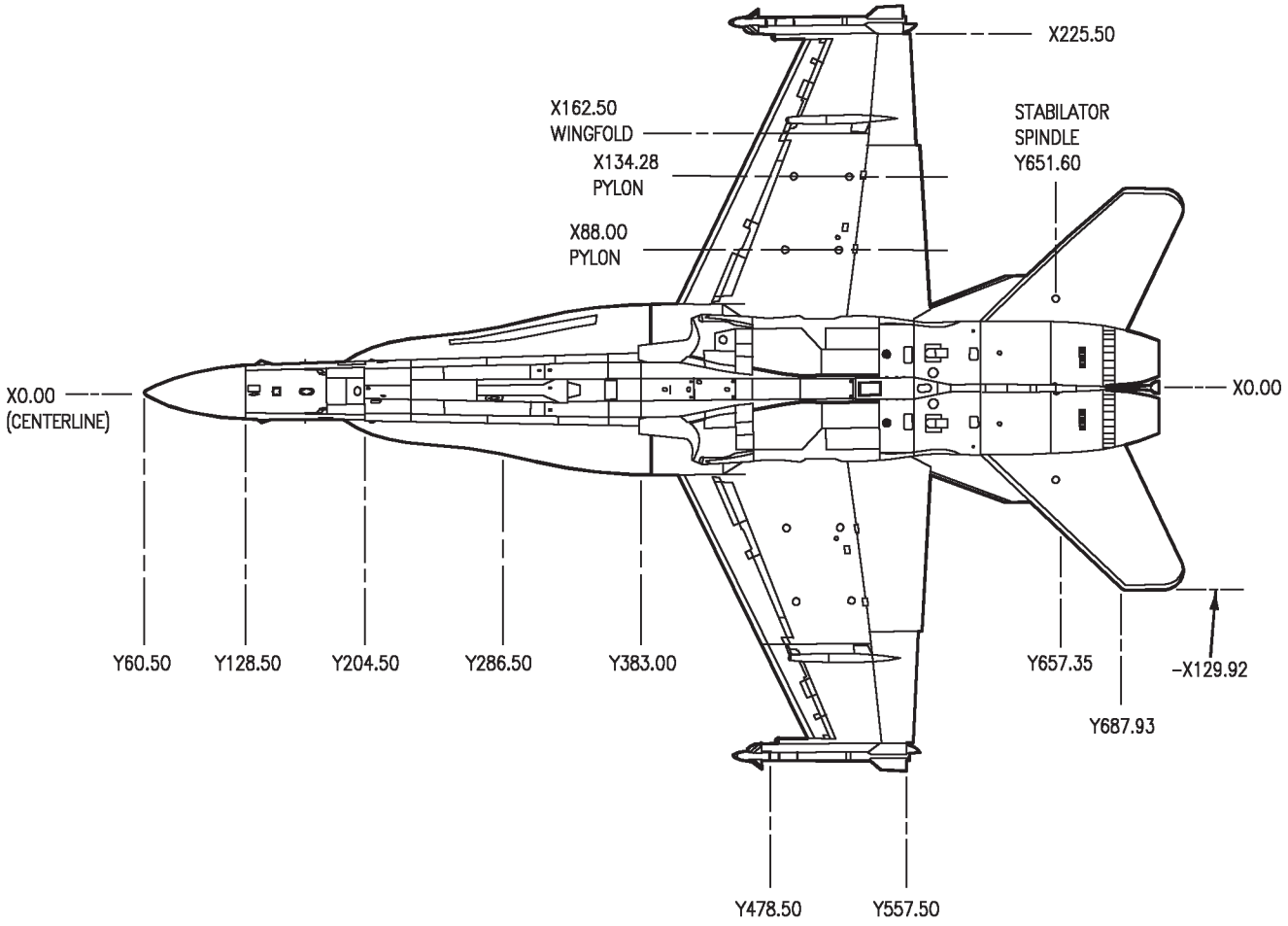


Figure 2. Aircraft Coordinates (Sheet 2)



1BAC-GAI-00-(1-3)16-CATI

Figure 2. Aircraft Coordinates (Sheet 3)

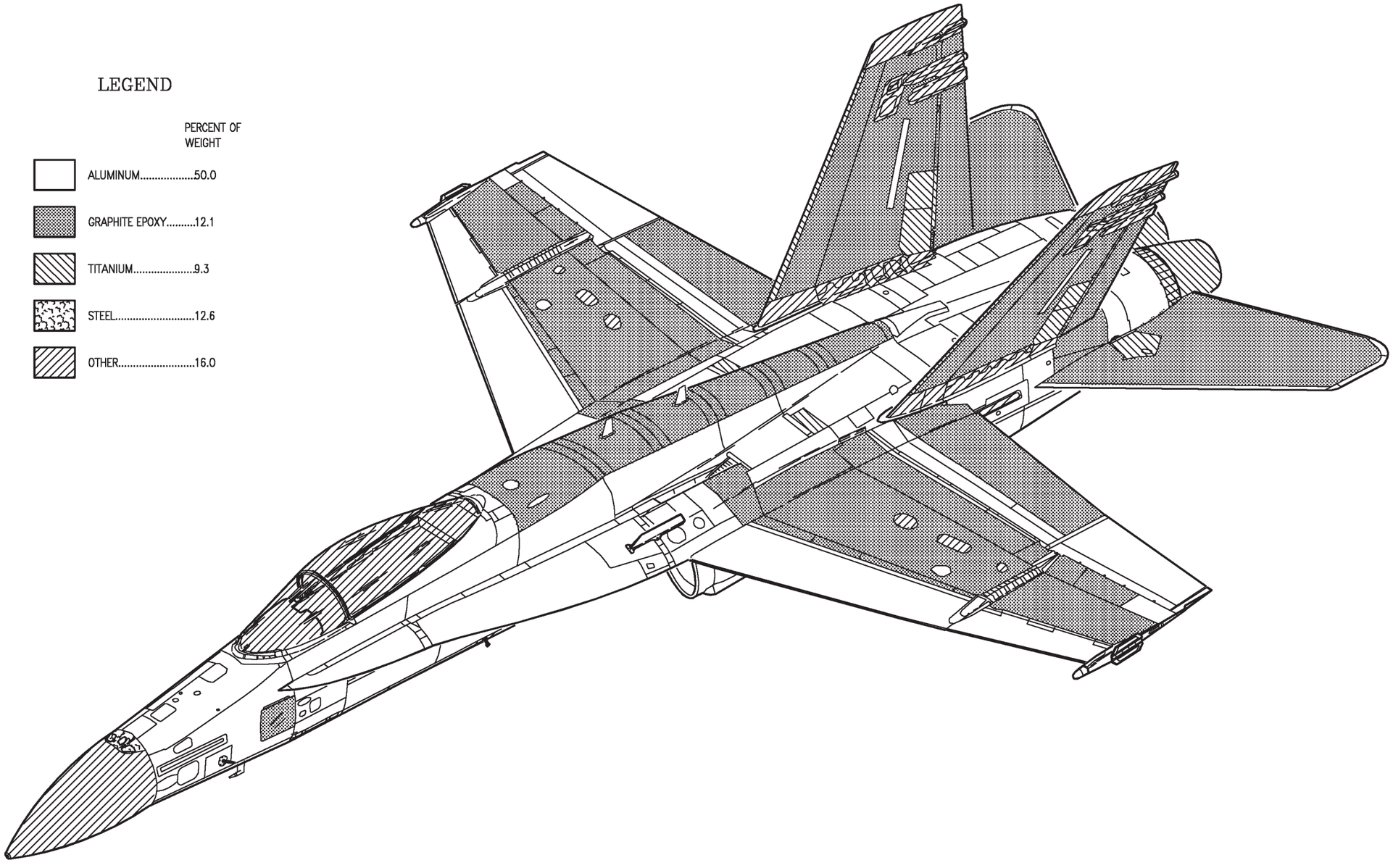


Figure 3.

Figure 3. Aircraft Materials Distribution (Sheet 1)

1BAC-GAI-00-(2-1)16-CATI
Figure 3.

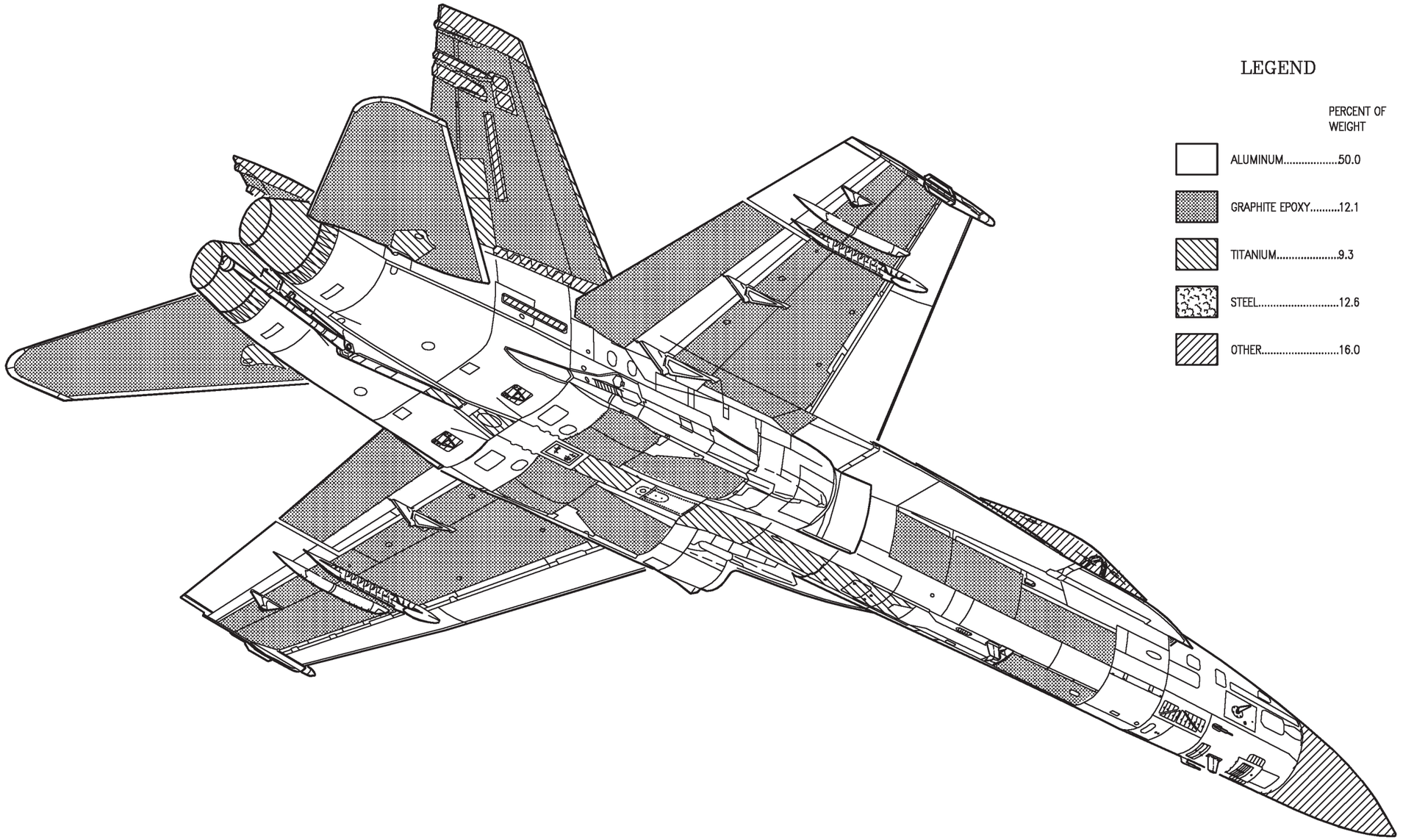


Figure 3.

Figure 3. Aircraft Materials Distribution (Sheet 2)

18AC-GAI-00-(2-2)16-CATI
Figure 3.

ORGANIZATIONAL MAINTENANCE

AIRCRAFT ARRANGEMENT

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 49	20 Feb 90	Sealed Lead Acid Battery, Addition of (ECP MDA-F/A-18-00074)	1 Feb 87	-
F/A-18 AFC 54	1 Aug 92	Video Recording System Incorporation (ECP MDA-F/A-18-00027)	1 Feb 87	-
F/A-18 AFC 57	1 Sep 90	Improved Aircraft Monitor and Control (AMAC), Installation of (ECP MDA-F/A-18-00087)	1 Feb 87	-
F/A-18 AFC 48	1 Jul 90	Automatic AC Bus Isolation, Incorporation of (ECP-MDA-F18-00121)	1 Jul 87	-
F/A-18 IAFC 102 PT. 4	6 May 88	Leading Edge Extension Fence, Installation of (ECP MDA-F/A-18-00300)	15 Oct 88	-
F/A-18 AFC 160	3 Jan 92	Dual Cockpit Control Capability For Nuclear Missions (ECP-MDA-F/A-18-00426)	1 Dec 91	-
F/A-18 AFC 236	-	Retrofit of Combined Interrogator/ Transponder (CIT) Identification Friend or Foe (IFF) System (ECP MDA-F/A-18-00520R1)	15 Mar 00	ECP Coverage Only
F/A-18 AFC 253	-	U.S. Naval Reserves A+ Avionics Upgrade, Installation of	15 Jun 01	ECP Coverage Only
F/A-18 AFC 268	-	Multifunctional Information Distribution System (MIDS) Amplifier-Control, Inter-communication (ACI), Incorporation of (ECP-MDC-F/A-18-00575)	15 Jun 01	ECP Coverage Only
F/A-18 AFC 270	-	Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT), Incorporation of (ECP-MDC-F/A-18-00577)	15 Jun 01	ECP Coverage Only
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A+ Avionics Upgrade, Installation of	1 Oct 00	ECP Coverage Only

1. **GENERAL ARRANGEMENT.** See figure 1. The aircraft consists of the items below:

a. Radome

b. Forward fuselage

c. Center fuselage

d. Aft fuselage

e. Wings

2. **RADOME.** The radome (figure 1) spans from Y coordinate 60.50 to Y coordinate 128.50. It is a filament wound fiberglass/epoxy shell mounted on an articulated hinge to allow easy access to the radar set. It provides an electrically transparent window for transmission and receiving of radar signals.

3. **FORWARD FUSELAGE.** The forward fuselage (figure 1) spans from Y coordinate 128.50 to Y coordinate 383.00. The forward fuselage includes the following:

a. Windshield

b. Canopy

c. Cockpit

d. Leading edge extension

e. Nose landing gear.

4. **Windshield.** The windshield is the aerodynamic fairing for the cockpit and allows forward visibility for the pilot. The one piece windshield is stretched acrylic attached to an aluminum frame. The frame is hinged to allow the windshield to rotate forward for instrument panel servicing.

5. **Canopy.** The one piece clamshell canopy is stretched acrylic attached to an aluminum frame. The F/A-18B and F/A-18D canopy is 54 inches longer and 125 pounds heavier than the F/A-18A and F/A-18C canopy. The canopy may be opened and closed by either manually or electrically operating the canopy actuator. When closed, the F/A-18A and F/A-18C canopy is secured by three latches and a forward latch pin on each side. The F/A-18B and F/A-18D canopy is secured by four latches and a forward latch pin on each side.

6. **Cockpit.** The F/A-18A and F/A-18C (figure 2, 3, and 4) have a single place cockpit. The F/A-18B and F/A-18D (figure 5) have a front and rear cockpit. These views are for familiarization purposes only.

7. **Leading Edge Extension.** The leading edge extension (LEX) is a highly swept and cambered extension of the wing leading edge, and provides added lift at high angles of attack. The boarding ladder is mounted in the left LEX (figure 1).

8. **Nose Landing Gear.** The nose landing gear shock strut assembly provides landing, takeoff, and taxi energy absorption, and tire/runway compliance. A dual chamber with high and low pressure pistons is included in the NLG shock strut assembly. The dual chamber provides a smooth, long stroke during landing and minimum aircraft attitude changes during catapult operation.

9. **CENTER FUSELAGE.** The center fuselage (figure 1) spans from Y coordinate 383.00 to Y coordinate 557.50. The center fuselage includes the following:

a. Main landing gear

b. Air intake ducts

c. External stores stations

d. Fuselage fuel tanks

e. Airframe mounted accessory drive

10. **Main Landing Gear.** The main landing gear is a lever design with an oleo shock absorber. The lever design provides a stable platform for aircraft carrier and shore based operations. The shock absorber absorbs the energy from ground loads during landing and taxi operations.

11. **Air Intake Ducts.** The air intake ducts are fixed, with a single external compression ramp. A ramp boundary layer bleed system provides the best inlet airflow during operation at supersonic speed.

12. **External Stores Stations.** There are three external stores stations on the center fuselage (figure 7): station 5, carries a mix of armament, fuel and avionics, station 4 or 6 carry AIM-7/AIM-120 missile.

13. **Fuselage Fuel Tanks.** All fuselage fuel tanks are bladder type tanks, supported by nylon lacing and fuel tank fittings. The motive flow fuel system can be refueled and defueled without the use of external electrical power.

14. **Airframe Mounted Accessory Drive (AMAD).** The AMAD system is made up of two interchangeable gearboxes, each connected to the engine by a power transmission shaft. The AMAD system is also connected to the APU through the air turbine starters. The accessories mounted on the AMAD gearboxes are: hydraulic pump, motive boost/flow (fuel) pump, pump, generator, and air turbine starter.

15. **AFT FUSELAGE.** The aft fuselage (figure 1) spans from Y coordinate 557.50 to the aft end of the aircraft. The aft fuselage includes the following:

a. Engines

b. Speed brake

c. Vertical stabilizers

d. Horizontal stabilators

e. Arresting hook

16. **Engines.** The F404-GE-400/F404-GE-402 engine is a low bypass, twin spool axial flow turbofan with afterburner. The engine is made up of six modules:

a. Fan

b. High pressure compressor

c. Combuster

d. High pressure turbine

e. Low pressure turbine

f. Afterburner

17. **Speed Brake.** The speed brake is hinged on the forward end, and is powered up and forward by a hydraulic actuator. The actuator is electrically controlled by a switch on the throttle handle. A blow-back feature is included to allow speed brake to partially retract when air loads become excessive.

18. **Vertical Stabilizers.** The two vertical stabilizers are mounted with a 1° toe out at the leading edge, and they are canted 20° outboard from vertical. Included on the vertical stabilizers are:

a. Fuel tank vents and dump outlets

b. Formation, position, and navigation lights

c. ECM antenna

d. Radar warning antenna

e. Hydraulic oil cooler ram air inlet

19. **Horizontal Stabilators.** The horizontal stabilators are attached to the fuselage on spindles. Hydraulic power provides control during normal operation, and a backup mechanical mode provides manual control during emergency operation.

20. **Arresting Hook.** The arresting hook is a hydraulically controlled arm attached to the underside of the aft fuselage. A hook point is attached to the end of the arm. When the arresting hook is lowered for carrier landing, the hook point engages an arrestment cable on the carrier deck to stop the aircraft.

21. **WINGS.** Each wing is attached to the center fuselage by wall lugs which mate lugs on the wing main torque box. All wing attach points are accessible through removable upper and lower wing-to-fuselage mold line access doors. The trailing edge aft of the rear spar has mounting areas for avionics components, flap actuator, plumbing, electrical conduit, and aileron control linkage. Small internal fuel tanks are located in the inboard section of each wing. The outer section of the wing folds up.

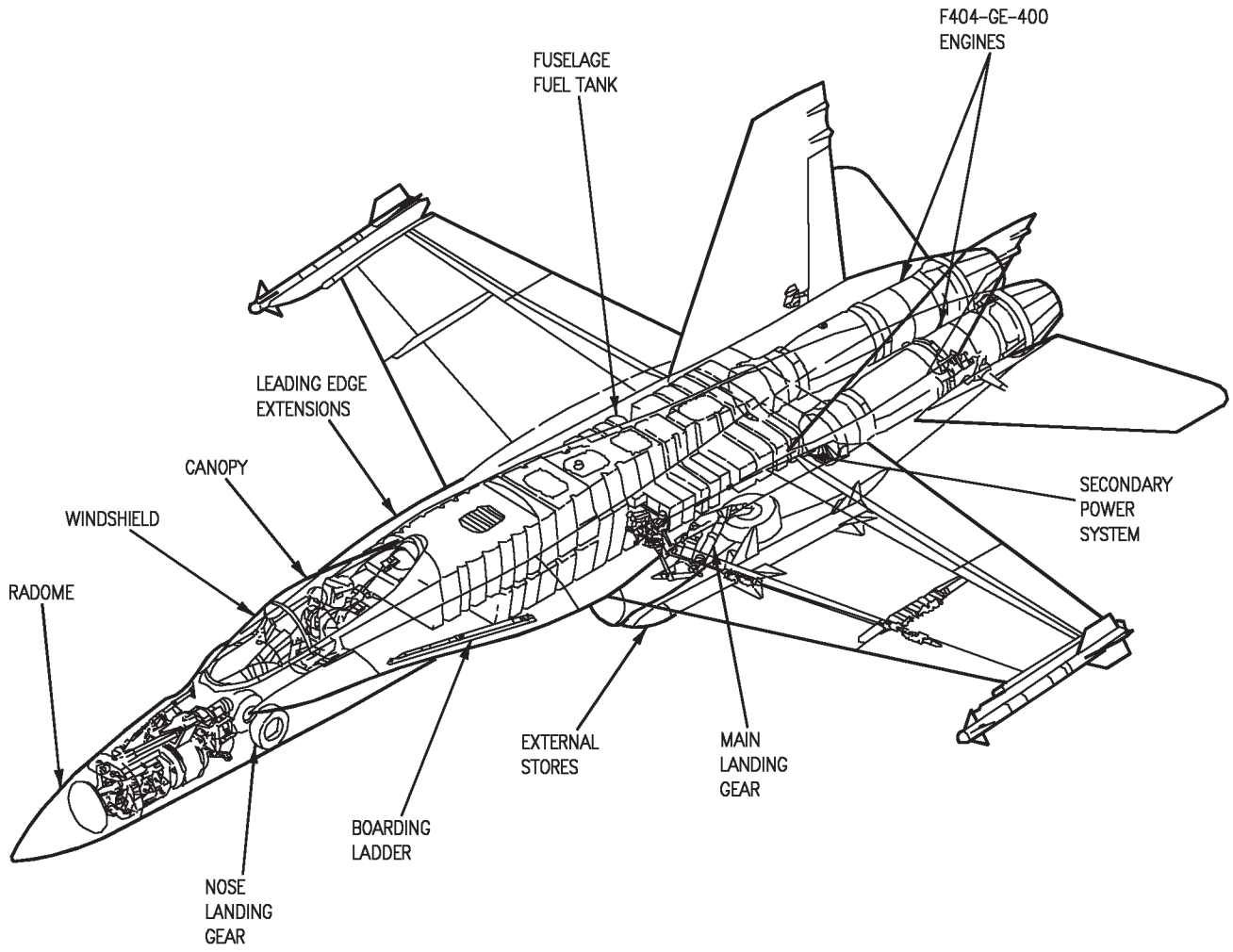
22. Each wing has three external weapon/store stations as shown on figure 7. The outer wing tip stations are stations 1 and 9. Wing tip stations are fitted with guided missile launchers LAU-7 and are capable of carrying AIM-9 sidewinder missiles. Each inboard wing has two pylon stations. Stations 2 and 3 are on the left wing and stations 7 and 8 are on the right wing. These wing stations require that non-jettisonable pylons be installed to carry weapons or stores. A/A and A/G weapons can be loaded on the pylons. Stations 3 and 7 are the inboard left and right stations and are also capable of carrying external fuel tanks.

23. **WALK AREAS.** See figure 6.

24. Maintenance personnel should walk only on designated areas shown. Protective shoe coverings should always be worn when walking on aircraft is necessary. Protective covers should be placed on walk areas during periods of high volume traffic. Portions of the flap and horizontal stabilator area may be used for walks, provided the applicable locks are installed. For ground protective devices (A1-F18AC-PCM-000).

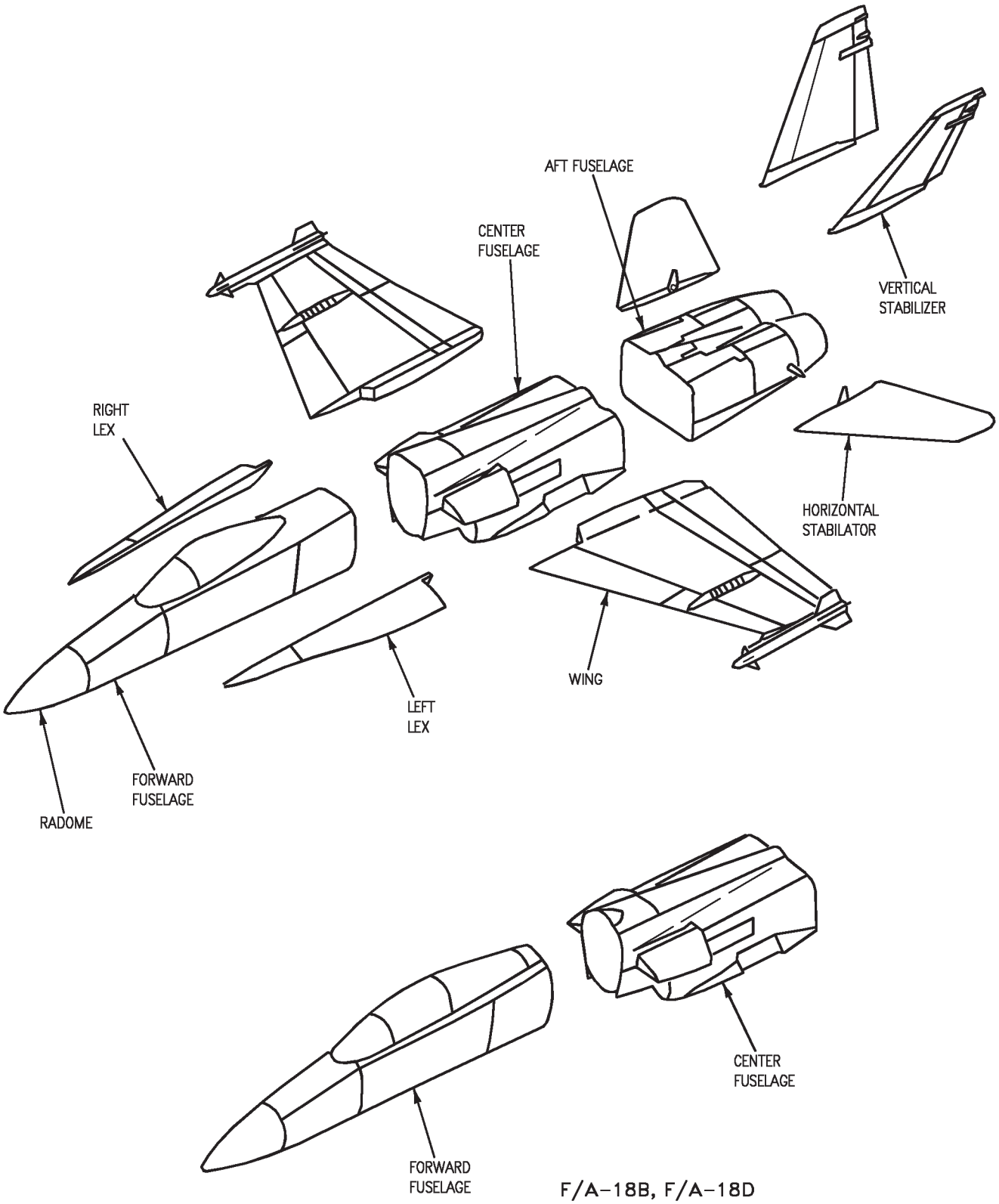
25. **MINIMUM STRUCTURAL ACCESS DOORS.**

26. Some access doors are an integral part of the aircraft structure. Any time the aircraft is subject to stress, these doors must be installed and/or closed. Procedures in A1-F18AC-LMM-000 that apply these requirements, reference the A1-F18AC-LMM-010.



18AC-GAI-00-(5-1)A-SCAN

Figure 1. Aircraft General Arrangement (Sheet 1)



18AC-GAI-00-(5-2)17-SCAN

Figure 1. Aircraft General Arrangement (Sheet 2)

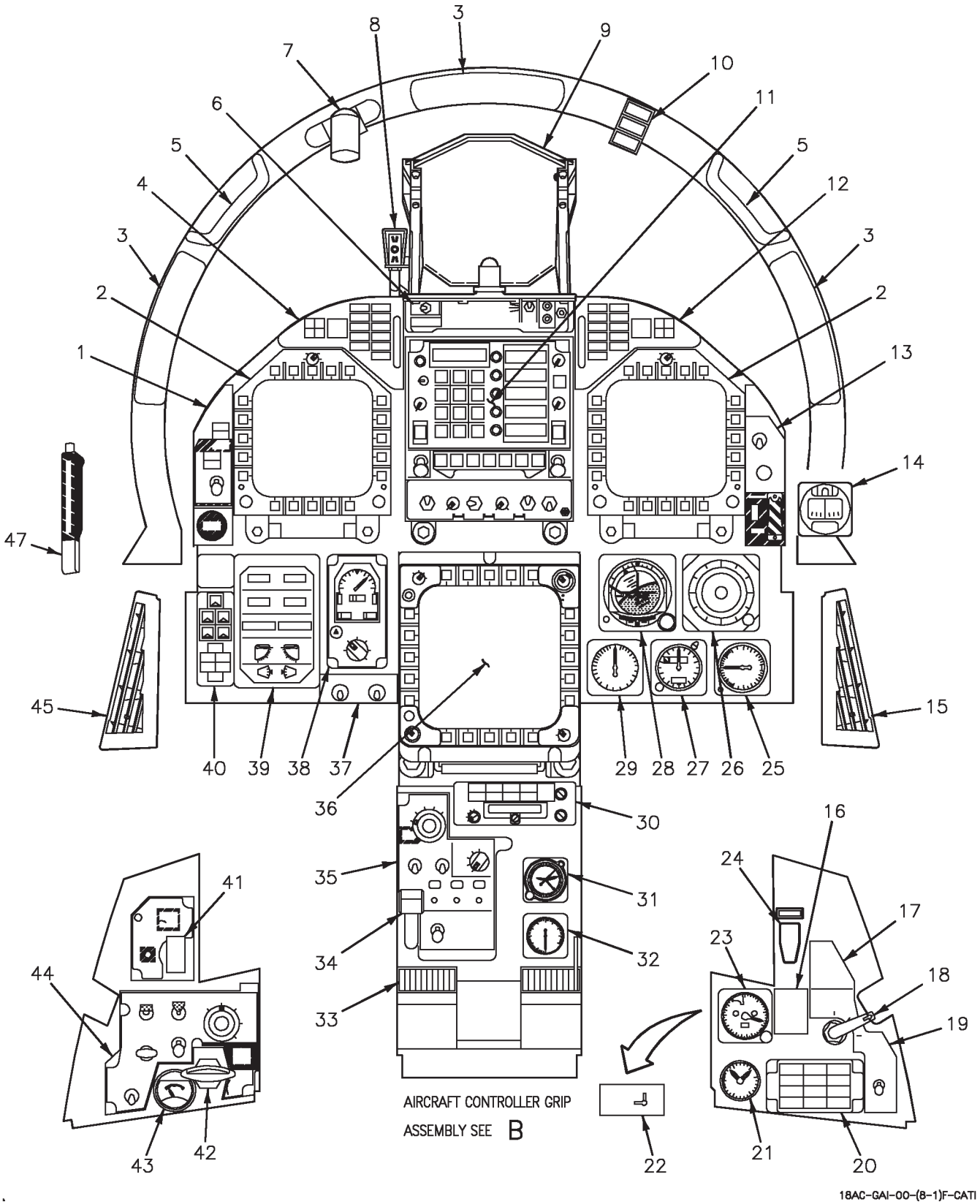
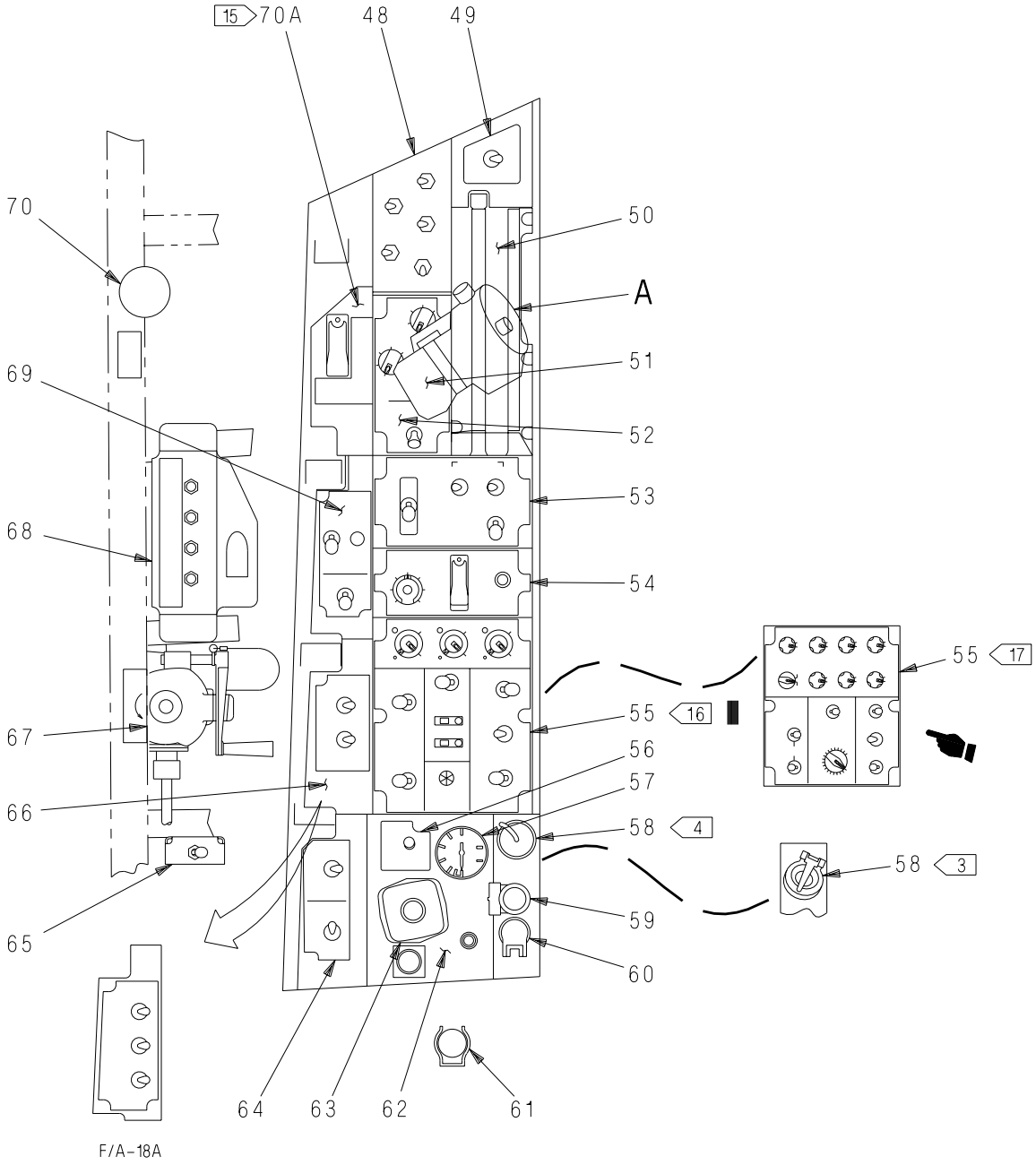
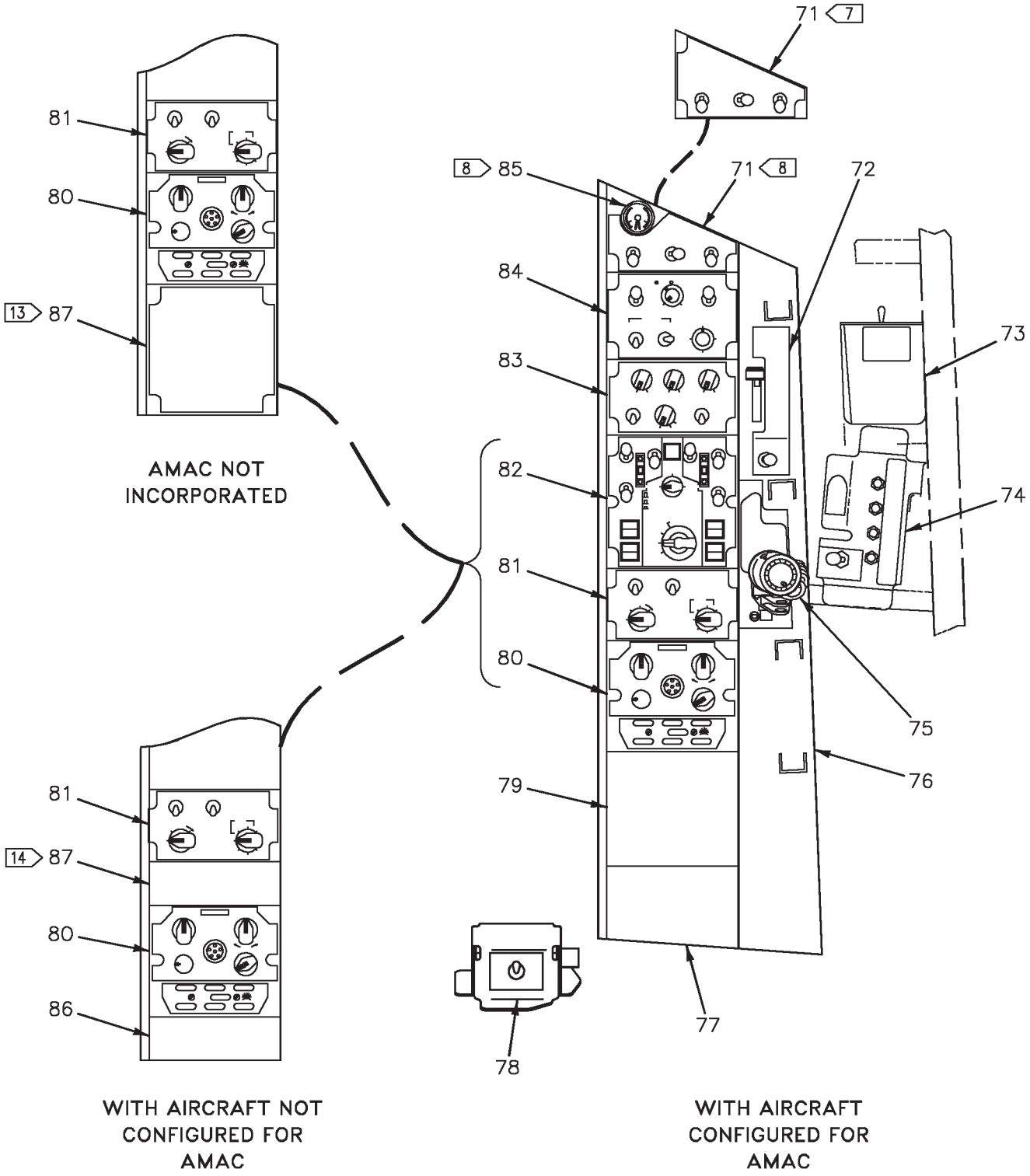


Figure 2. Cockpit Orientation-161353 THRU 163175 (Sheet 1)



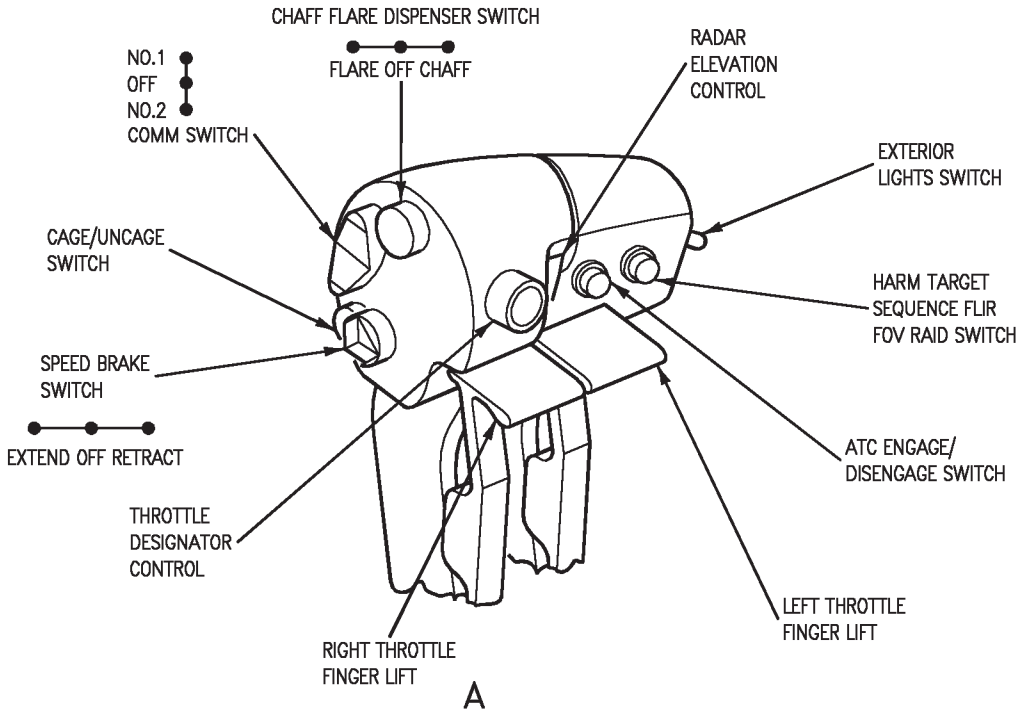
ADA540-8-2-031

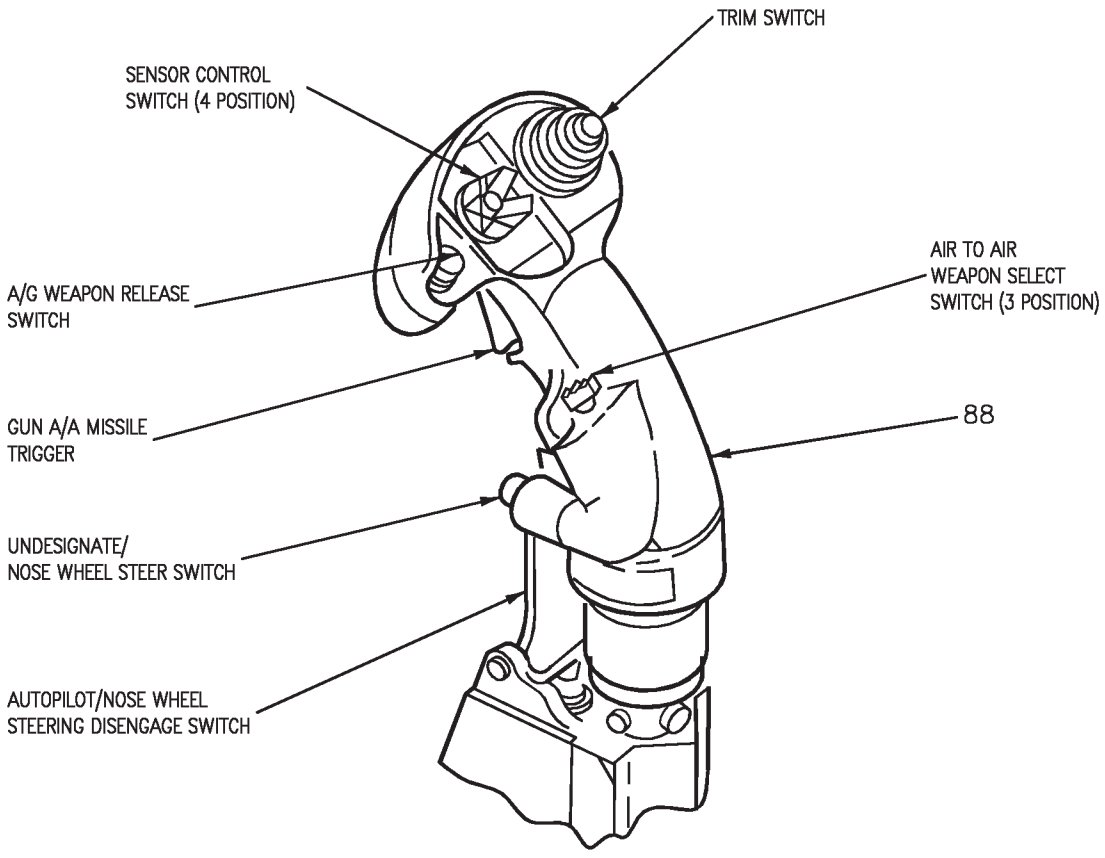
Figure 2. Cockpit Orientation-161353 THRU 163175 (Sheet 2)



18AC-GAI-00-(8-3)F-CATI

Figure 2. Cockpit Orientation-161353 THRU 163175 (Sheet 3)





18AC-GAI-00-(8-4)F-CATI

Figure 2. Cockpit Orientation-161353 THRU 163175 (Sheet 4)

INDEX NO.	NOMENCLATURE
1	MASTER ARM CONTROL PANEL ASSEMBLY
2	DIGITAL DISPLAY INDICATOR
3	REARVIEW MIRROR
4	LH ADVISORY AND THREAT WARNING INDICATOR PANEL
5	CANOPY BOW PANEL
9 ▶6	BLANK PANEL
10 ▶	TELEVISION CAMERA
7	CHART LIGHT
8	AOA INDEXER ASSEMBLY
9	HEAD-UP DISPLAY UNIT AN/AVQ-28
10	LOCK/SHOOT LIGHT ASSEMBLY
11	ELECTRONIC EQUIPMENT CONTROL C-10380/ASQ
12	RH ADVISORY AND THREAT WARNING INDICATOR PANEL
13	MAP GAIN CONTROL PANEL ASSEMBLY
14	STANDBY COMPASS AQU-3/A
15	RIGHT COCKPIT ECS LOUVER
16	BUNO LIGHT PANEL
17	WING FOLD LIGHT PANEL
18	WING FOLD CONTROL PANEL
5 ▶19	FCS COOL SWITCH
6 ▶	AV COOL SWITCH
20	CAUTION LIGHT INDICATOR PANEL
21	HYDRAULIC PRESSURE INDICATOR AGU-15/A
22	STATIC SOURCE SELECT VALVE
23	HEIGHT INDICATOR ID-2163/A
24	ARRESTING HOOK CONTROL HANDLE
25	VERTICAL SPEED INDICATOR AVU-29/A
1 ▶26	BLANK PANEL
2 ▶	AZIMUTH INDICATOR OR BLANK PANEL
27	STANDBY PRESSURE ALTIMETER AAU-39/A
28	ATTITUDE REFERENCE INDICATOR ARU-48/A
29	INDICATED AIRSPEED INDICATOR AVU-30/A
1 ▶30	BLANK PANEL
2 ▶	CONTROL-INDICATOR OR BLANK PANEL
31	MECHANICAL AIRCRAFT CLOCK ABU-24/A
32	PRESSURIZED COMPARTMENT ALTIMETER AAU-38/A
33	CENTER COCKPIT ECS LOUVER
34	RUDDER PEDAL POSITION ADJUST HANDLE
35	ECM CONTROL PANEL ASSEMBLY
36	HORIZONTAL INDICATOR IP-1350/A
37	HDG SET AND CRS SET SWITCHES
38	FUEL QTY INDICATOR
39	CREW STATION ENGINE MONITOR INDICATOR AEU-12/A
40	FLAPS, LANDING GEAR AND STORES INDICATOR PANEL
41	LDG GEAR CONTROL
42	EMERG BRK/PARK BRK CONTROL
43	HYDRAULIC BRAKE PRESSURE INDICATOR
44	LH VERTICAL CONSOLE CONTROL PANEL
45	LEFT COCKPIT ECS LOUVER
46	EMERG JETT SWITCH
47	INTERNAL CANOPY JETT LEVER
48	GND PWR CONTROL PANEL ASSEMBLY
49	FIRE TEST PANEL
50	THROTTLE QUADRANT CLOSURE PANEL
51	EXT LT CONTROL PANEL ASSEMBLY

Figure 2. Cockpit Orientation 161353 THRU 163175 (Sheet 5)

INDEX NO.	NOMENCLATURE
52	INTR WING SWITCH
53	FUEL SYSTEM CONTROL PANEL
54	FCS CONTROL PANEL C-10406/ASW-44
55	INTERCOMMUNICATION AMPLIFIER-CONTROL
56	OXYGEN ON/OFF VALVE
57	LIQUID OXYGEN QUANTITY INDICATOR GMU-75/A
58	ANTI-G SUIT DISCONNECT
59	VENT SUIT AIR HOSE ASSEMBLY
60	AIRCRAFT/SEAT OXYGEN DISCONNECT
61	COMM RECEPTACLE
62	PILOT SERVICES CONTROL PANEL ASSEMBLY
63	ANTI-G VALVE
64	MC/HYD ISO CONTROL PANEL ASSEMBLY
65	NUC WPN SWITCH PANEL ASSEMBLY
66	ANT SEL CONTROL PANEL ASSEMBLY
67	CONTROL ACTUATOR MANUAL DRIVE UNIT
68	LH ESSENTIAL CIRCUIT BREAKERS CONTROL PANEL ASSEMBLY
69	APU CONTROL PANEL
70	ECM DISP SWITCH
15 70A	GEN TIE CONTROL PANEL ASSEMBLY
71	ELEC POWER CONTROL PANEL ASSEMBLY
72	DEFOG CONTROL ASSEMBLY
73	INTERNAL CANOPY CONTROL SWITCH
74	RH ESSENTIAL CIRCUIT BREAKERS CONTROL PANEL ASSEMBLY
75	LIGHT SUPPORT AND MAD COMPENSATOR PANEL ASSEMBLY
76	MAP AND DATA CASE
77	BLANK PANEL
78	FAN TEST CONTROL PANEL ASSEMBLY
79	BLANK PANEL
80	KY-58 CONTROL PANEL ASSEMBLY OR BLANK PANEL
81	SNSR POD CONTROL BOX PANEL ASSEMBLY
82	AMAC CONTROL
83	INTR LT CONTROL BOX PANEL ASSEMBLY
84	ECS PANEL ASSEMBLY
85	E/U BATT VOLTMETER
86	BLANK PANEL
87	AMAC CONTROL DUMMY PANEL
88	AIRCRAFT CONTROLLER GRIP ASSEMBLY

LEGEND

1 161353 THRU 161528
2 161702 AND UP
3 161353 THRU 162852
4 162853 AND UP
5 161353 THRU 162909
6 163092 AND UP
7 161353 THRU 161528 BEFORE F/A-18 AFC 49
8 161702 AND UP; ALSO 161353 THRU 161528 AFTER F/A-18 AFC 49
9 161353 THRU 161528 BEFORE F/A-18 AFC 54
10 161702 AND UP; ALSO 161353 THRU 161528 AFTER F/A-18 AFC 54
11 161353 THRU 161924 BEFORE F/A-18 AFC 57

Figure 2. Cockpit Orientation 161353 THRU 163175 (Sheet 6)

LEGEND

12 161925 AND UP; ALSO 161353 THRU 161924 AFTER F/A-18 AFC 57
13 161353 THRU 161924 BEFORE F/A-18 AFC 54
14 161925 AND UP; ALSO 161353 THRU 161924 AFTER F/A-18 AFC 54
15 162394 AND UP; ALSO 161353 THRU 161987 AFTER F/A-18 AFC 48
16 F/A-18A 161353 THRU 161987 AND F/A-18B; ALSO F/A-18A 162394 THRU 162477 BEFORE F/A-18 AFC 292 AND F/A-18A 162826 THRU 163175 BEFORE F/A-18 AFC 253 OR F/A-18 AFC 292
17 F/A-18A 162394 THRU 162477 AFTER F/A-18 AFC 292 AND F/A-18A 162826 THRU 163175 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292

Figure 2. Cockpit Orientation 161353 THRU 163175 (Sheet 7)

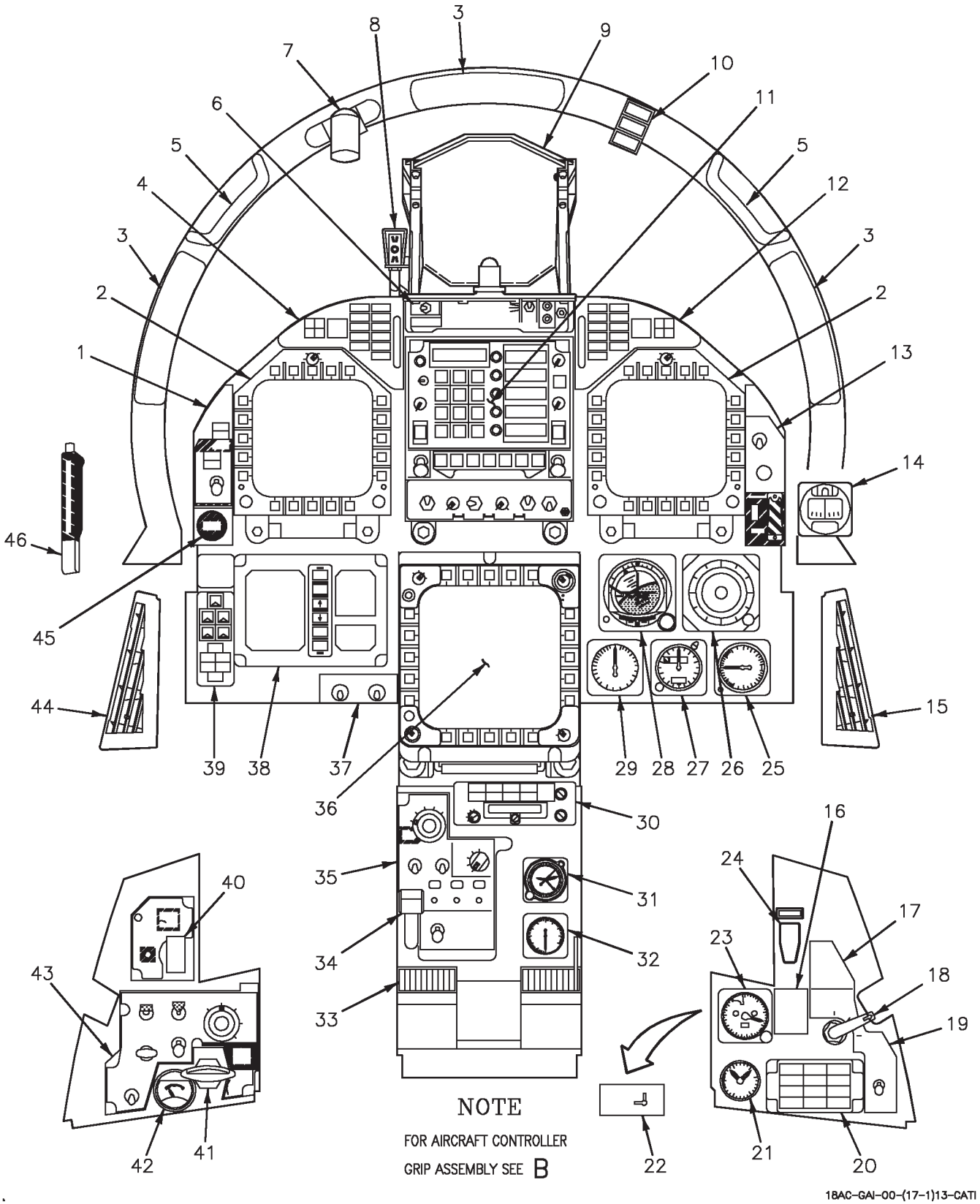


Figure 3. Cockpit Orientation-163427 THRU 163782 (Sheet 1)

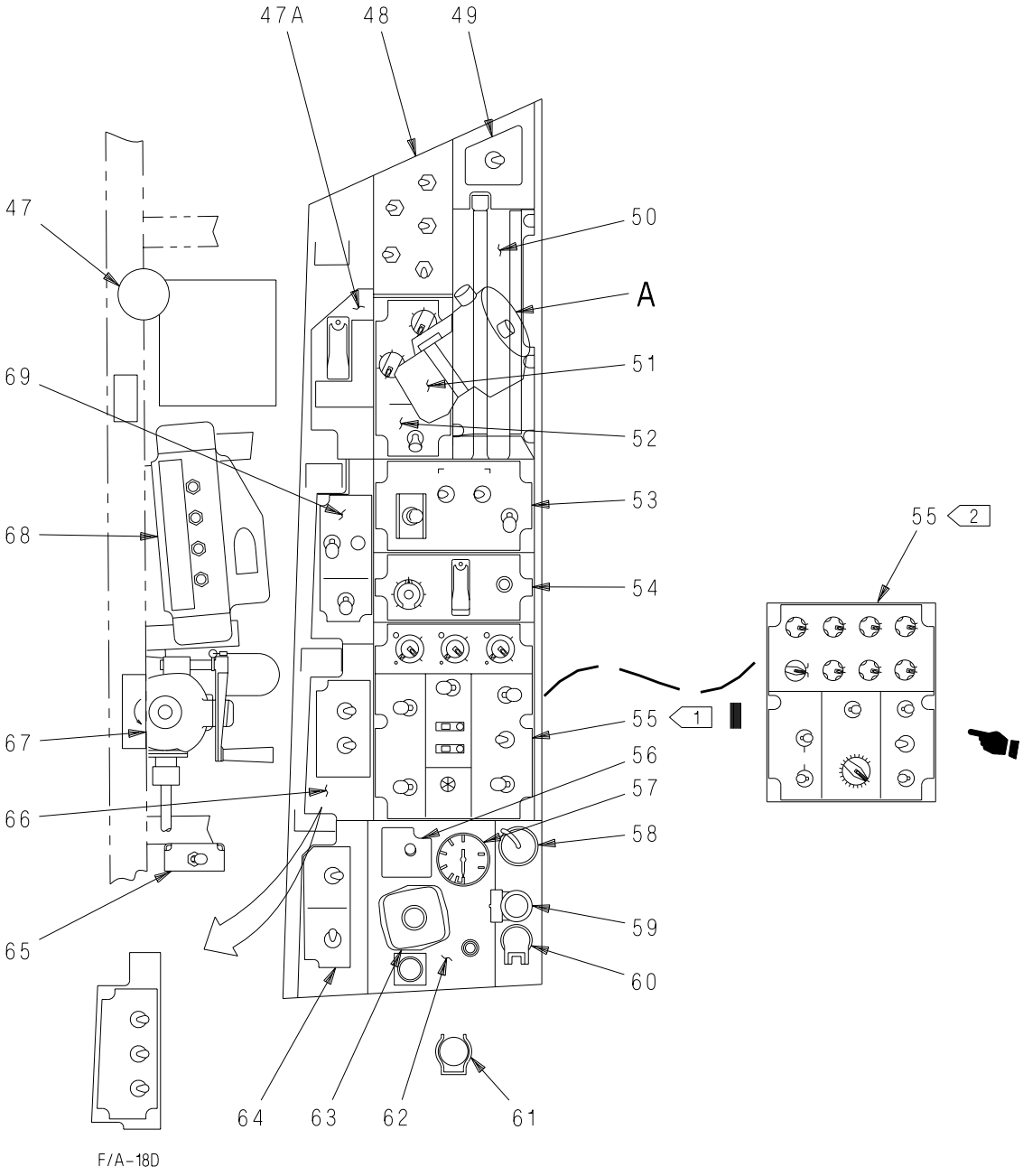


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Figure 3. Cockpit Orientation-163427 THRU 163782 (Sheet 2)

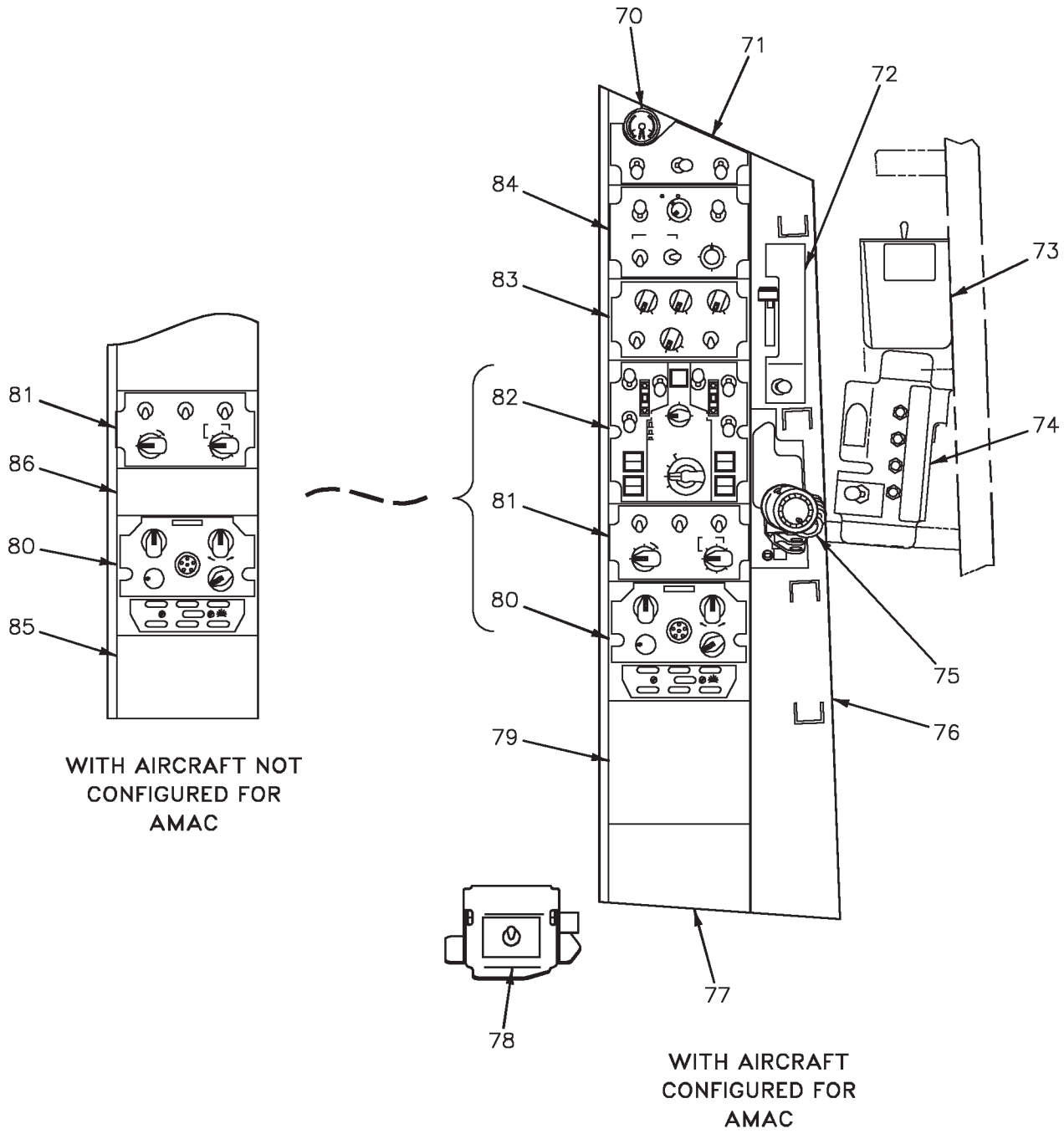

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Figure 3. Cockpit Orientation-163427 THRU 163782 (Sheet 3)

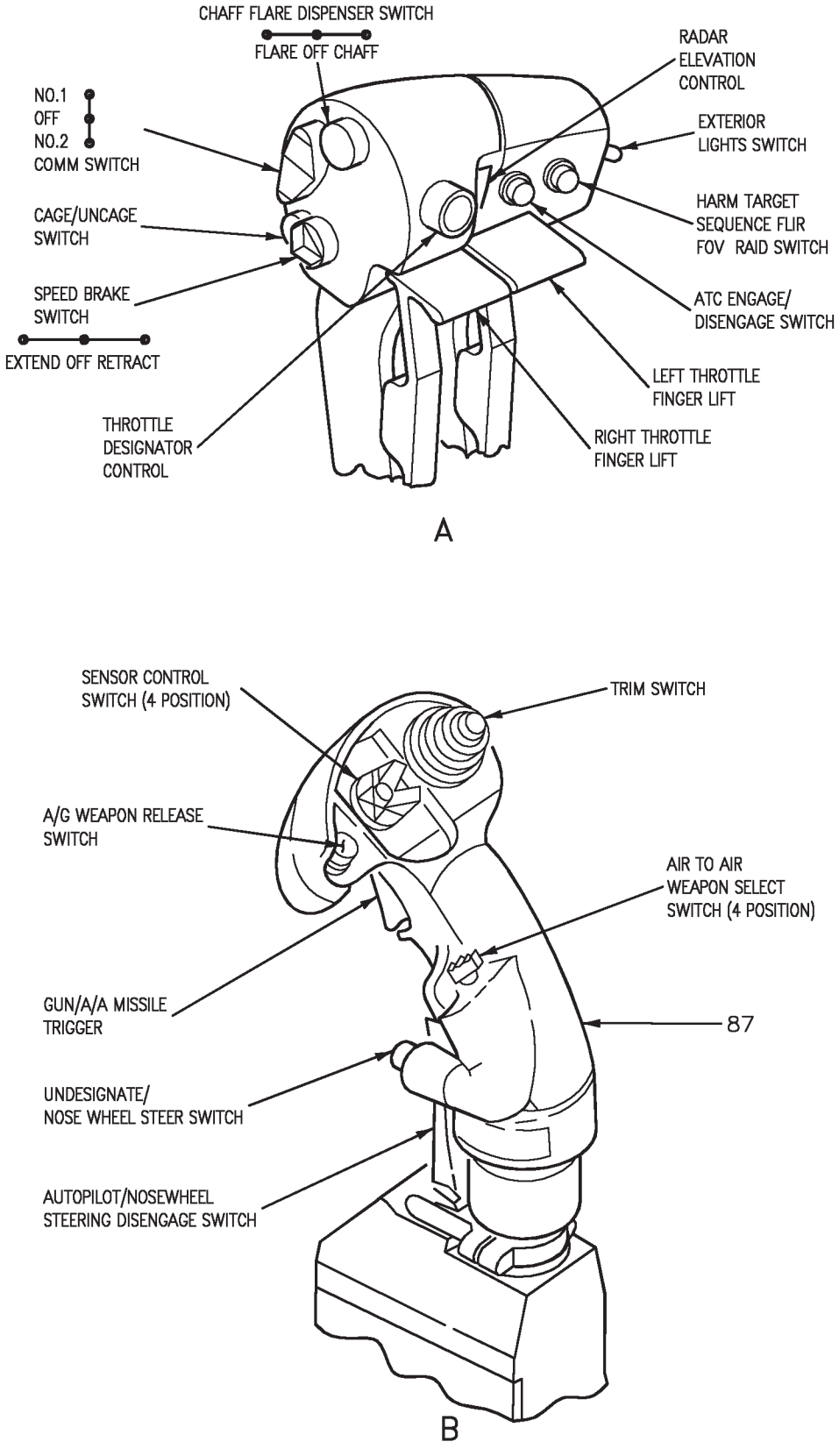

Figure 3. Cockpit Orientation-163427 THRU 163782 (Sheet 4)

INDEX NO.	NOMENCLATURE
1	MASTER ARM CONTROL PANEL ASSEMBLY
2	DIGITAL DISPLAY INDICATOR
3	REARVIEW MIRROR
4	LH ADVISORY AND THREAT WARNING INDICATOR PANEL
5	CANOPY BOW PANEL
6	TELEVISION CAMERA
7	CHART LIGHT
8	AOA INDEXER ASSEMBLY
9	HEAD-UP DISPLAY UNIT AN/AVQ-28
10	LOCK/SHOOT LIGHT ASSEMBLY
11	ELECTRONIC EQUIPMENT CONTROL C-10380/ASQ
12	RH ADVISORY AND THREAT WARNING INDICATOR PANEL
13	MAP GAIN CONTROL PANEL ASSEMBLY
14	STANDBY COMPASS AQU-3/A
15	RIGHT COCKPIT ECS LOUVER
16	BUNO LIGHT PANEL
17	WING FOLD LIGHT PANEL
18	WING FOLD CONTROL PANEL
19	AV COOL SWITCH
20	CAUTION LIGHT INDICATOR PANEL
21	HYDRAULIC PRESSURE INDICATOR AGU-15/A
22	STATIC SOURCE SELECT VALVE
23	HEIGHT INDICATOR ID-2163/A
24	ARRESTING HOOK CONTROL HANDLE
25	VERTICAL SPEED INDICATOR AVU-29/A
26	AZIMUTH INDICATOR OR BLANK PANEL
27	STANDBY PRESSURE ALTIMETER AAU-39/A
28	ATTITUDE REFERENCE INDICATOR ARU-48/A
29	INDICATED AIRSPEED INDICATOR AVU-30/A
30	CONTROL-INDICATOR OR BLANK PANEL
31	MECHANICAL AIRCRAFT CLOCK ABU-24/A
32	PRESSURIZED COMPARTMENT ALTIMETER AAU-38/A
33	CENTER COCKPIT ECS LOUVER
34	RUDDER PEDAL POSITION ADJUST HANDLE
35	ECM CONTROL PANEL ASSEMBLY
36	HORIZONTAL INDICATOR IP-1350/A
37	HDG SET AND CRS SET SWITCHES
38	INTEGRATED FUEL-ENGINE INDICATOR ID-2389/A
39	FLAPS, LANDING GEAR AND STORES INDICATOR PANEL
40	LDG GEAR CONTROL
41	EMERG BRK/PARK BRK CONTROL
42	HYDRAULIC BRAKE PRESSURE INDICATOR
43	LH VERTICAL CONSOLE CONTROL PANEL
44	LEFT COCKPIT ECS LOUVER
45	EMERG JETT SWITCH
46	INTERNAL CANOPY JETT LEVER
47	ECM DISP SWITCH
47A	GEN TIE CONTROL PANEL ASSEMBLY
48	GND PWR CONTROL PANEL ASSEMBLY
49	FIRE TEST PANEL
50	THROTTLE QUADRANT CLOSURE PANEL
51	EXT LT CONTROL PANEL ASSEMBLY
52	INTR WING SWITCH
53	FUEL SYSTEM CONTROL PANEL
54	FCS CONTROL PANEL C-10406/ASW-44

Figure 3. Cockpit Orientation 163427 THRU 163782 (Sheet 5)

INDEX NO.	NOMENCLATURE
55	INTERCOMMUNICATION AMPLIFIER-CONTROL
56	OXYGEN ON/OFF VALVE
57	LIQUID OXYGEN QUANTITY INDICATOR GMU-75/A
58	ANTI-G SUIT DISCONNECT
59	VENT SUIT AIR HOSE ASSEMBLY
60	AIRCRAFT/SEAT OXYGEN DISCONNECT
61	COMM RECEPTACLE
62	PILOT SERVICES CONTROL PANEL ASSEMBLY
63	ANTI-G VALVE
64	MC/HYD ISO CONTROL PANEL ASSEMBLY
65	NUC WPN SWITCH PANEL ASSEMBLY
66	ANT SEL CONTROL PANEL ASSEMBLY
67	CANOPY ACTUATOR MANUAL DRIVE UNIT
68	LH ESSENTIAL CIRCUIT BREAKERS CONTROL PANEL ASSEMBLY
69	APU CONTROL PANEL
70	E/U BATT VOLTMETER
71	ELEC POWER CONTROL PANEL ASSEMBLY
72	DEFOG CONTROL ASSEMBLY
73	INTERNAL CANOPY CONTROL SWITCH
74	RH ESSENTIAL CIRCUIT BREAKERS CONTROL PANEL ASSEMBLY
75	LIGHT SUPPORT AND MAD COMPENSATOR PANEL ASSEMBLY
76	MAP AND DATA CASE
77	BLANK PANEL
78	FAN TEST CONTROL PANEL ASSEMBLY
79	BLANK PANEL
80	KY-58 CONTROL PANEL ASSEMBLY OR BLANK PANEL
81	SNSR POD CONTROL BOX PANEL ASSEMBLY
82	AMAC CONTROL
83	INTR LT CONTROL BOX PANEL ASSEMBLY
84	ECS PANEL ASSEMBLY
85	BLANK PANEL
86	AMAC CONTROL DUMMY PANEL
87	AIRCRAFT CONTROLLER GRIP ASSEMBLY

LEGEND

1 BEFORE F/A-18 AFC 268
2 AFTER F/A-18 AFC 268

Figure 3. Cockpit Orientation 163427 THRU 163782 (Sheet 6)

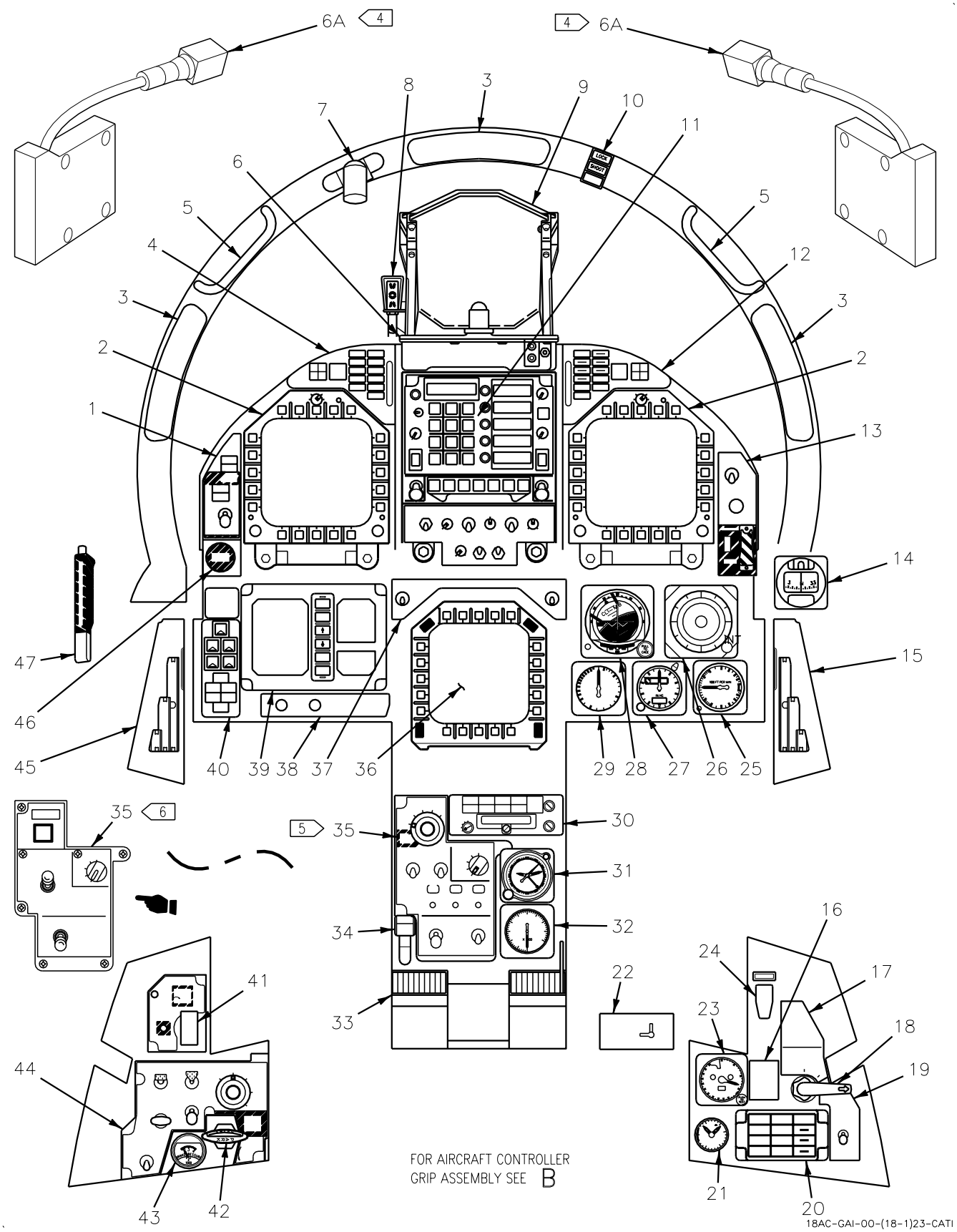

Figure 4. Cockpit Orientation - 163985 AND UP (Sheet 1)

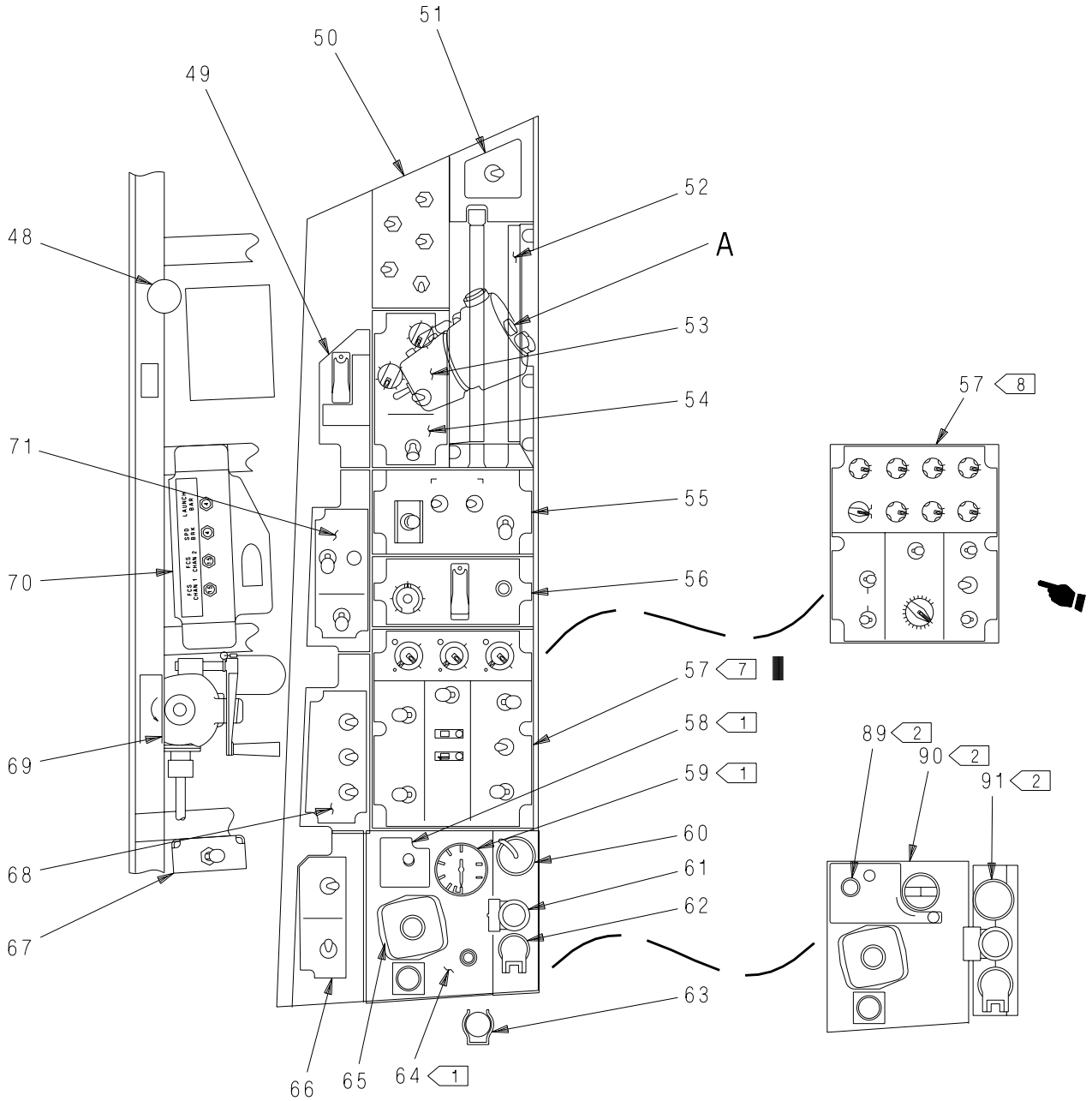

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Figure 4. Cockpit Orientation - 163985 AND UP (Sheet 2)

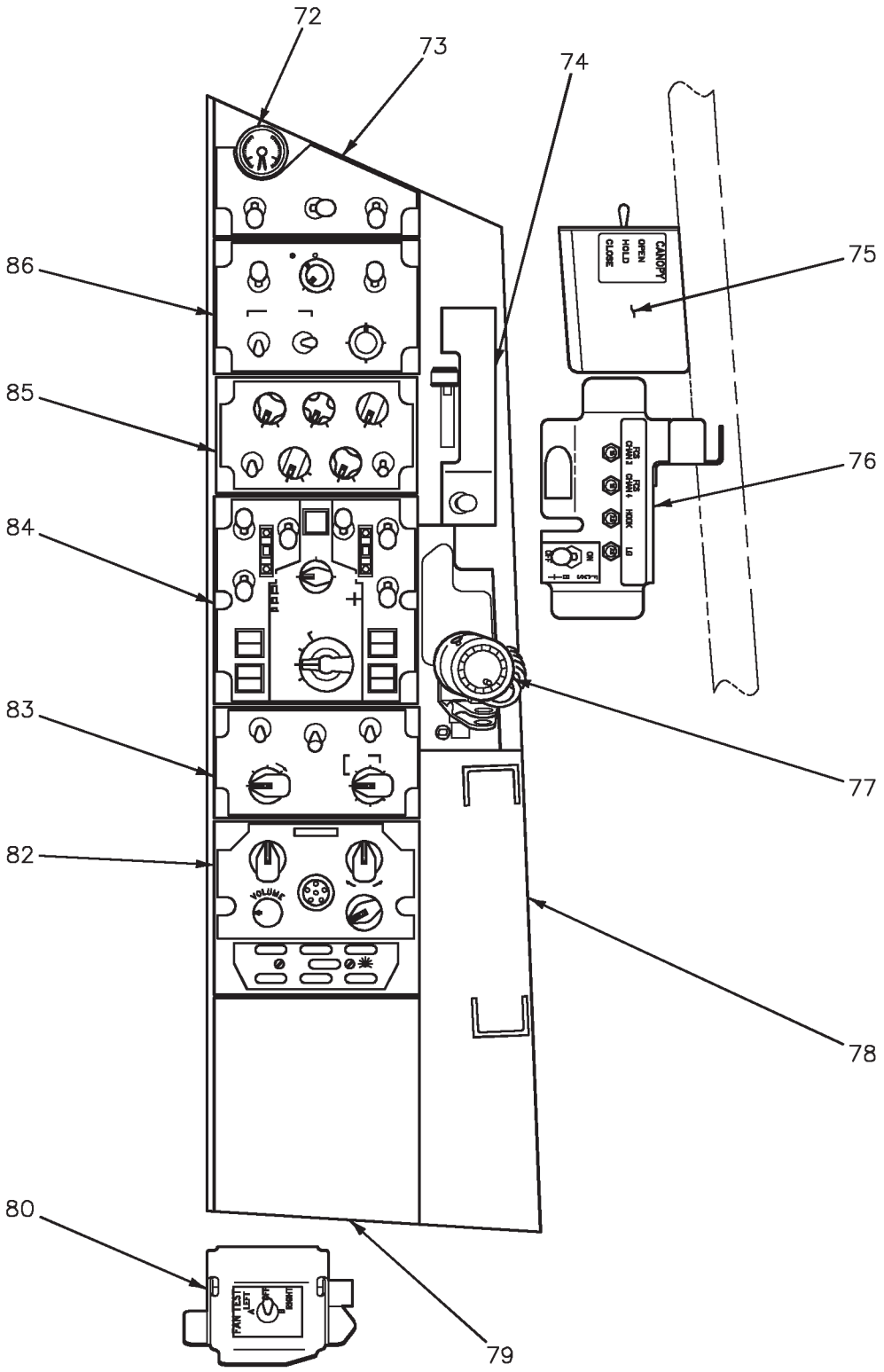

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Figure 4. Cockpit Orientation - 163985 AND UP (Sheet 3)

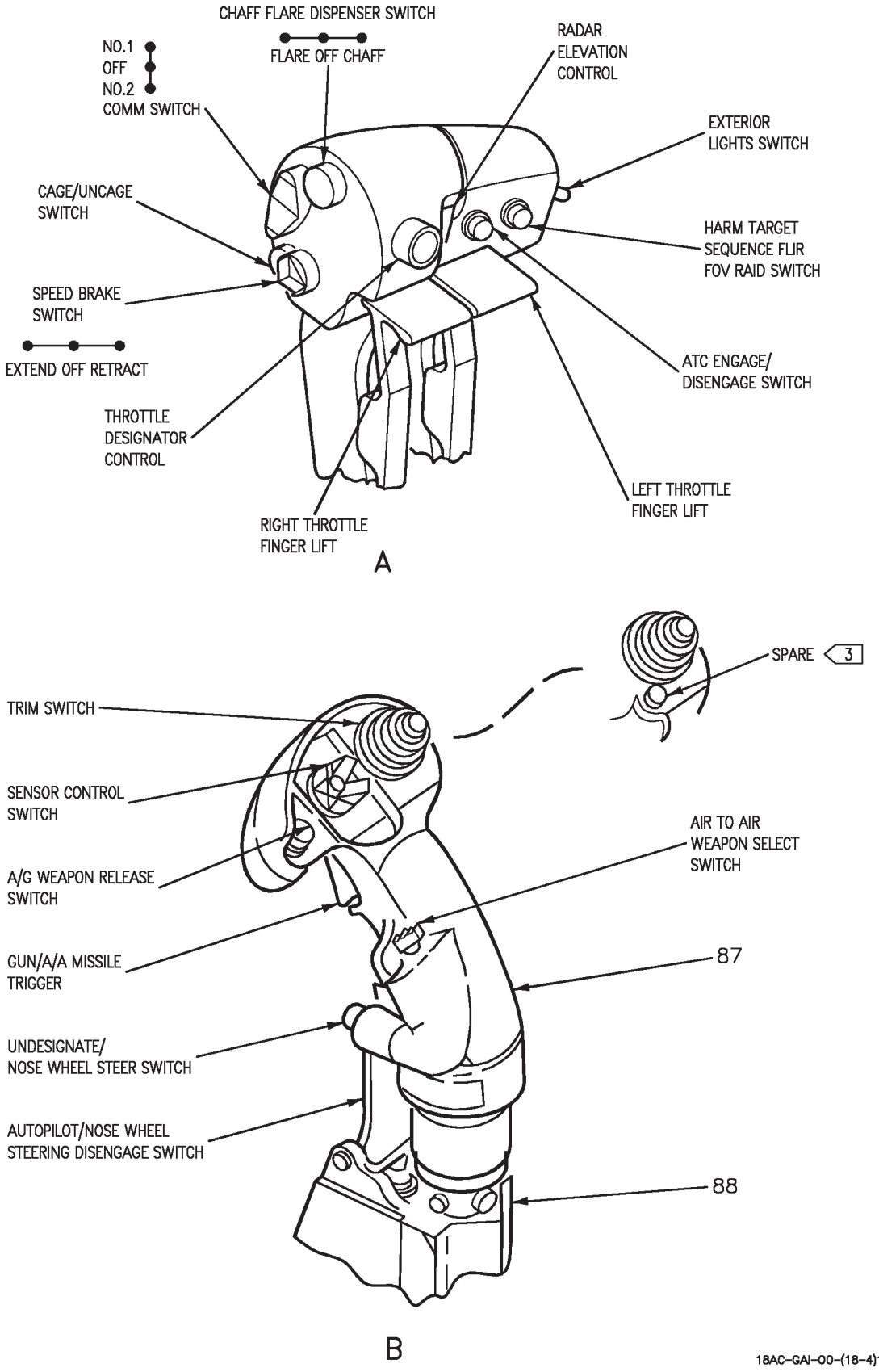

Figure 4. Cockpit Orientation - 163985 AND UP (Sheet 4)

INDEX NO.	NOMENCLATURE
1	MASTER ARM CONTROL PANEL ASSEMBLY
2	DIGITAL DISPLAY INDICATOR
3	REARVIEW MIRROR
4	LH ADVISORY AND THREAT WARNING INDICATOR PANEL
5	CANOPY BOW PANEL
6	TELEVISION CAMERA
4 ▶6A	VIDEO SENSOR HEAD / INTERFACE CONTROLLER #1 AND #2.
7	CHART LIGHT
8	AOA INDEXER ASSEMBLY
9	HEAD-UP DISPLAY UNIT
10	LOCK/SHOOT LIGHT ASSEMBLY
11	ELECTRONIC EQUIPMENT CONTROL C-11919/ASQ
12	RH ADVISORY AND THREAT WARNING INDICATOR PANEL
13	MAP GAIN CONTROL PANEL ASSEMBLY
14	STANDBY COMPASS AQU-3/A
15	RIGHT COCKPIT ECS LOUVER
16	BUNO LIGHT PANEL
17	WING FOLD LIGHT PANEL
18	WING FOLD CONTROL PANEL
19	AV COOL SWITCH
20	CAUTION LIGHT INDICATOR PANEL
21	HYDRAULIC PRESSURE INDICATOR AGU-15/A
22	STATIC SOURCE SELECT VALVE
23	HEIGHT INDICATOR ID-2163/A
24	ARRESTING HOOK CONTROL HANDLE
25	VERTICAL SPEED INDICATOR AVU-29/A
26	AZIMUTH INDICATOR OR BLANK PANEL
27	STANDBY PRESSURE ALTIMETER AAU-39/A
28	ATTITUDE REFERENCE INDICATOR ARU-48/A
29	INDICATED AIRSPEED INDICATOR AVU-30/A
30	CONTROL-INDICATOR OR BLANK PANEL
31	MECHANICAL AIRCRAFT CLOCK ABU-24/A
32	PRESSURIZED COMPARTMENT ALTIMETER AAU-38/A
33	CENTER COCKPIT ECS LOUVER
34	RUDDER PEDAL POSITION ADJUST HANDLE
35	ECM CONTROL PANEL ASSEMBLY
36	MULTIPURPOSE COLOR DISPLAY
37	HDG/CRS SET SWITCH PANEL
38	LH LOWER INSTRUMENT PANEL ASSEMBLY
39	INTEGRATED FUEL-ENGINE INDICATOR ID-2389/A
40	FLAPS, LANDING GEAR AND STORES INDICATOR PANEL
41	LDG GEAR CONTROL
42	EMERG BRK/PARK BRK CONTROL
43	HYDRAULIC BRAKE PRESSURE INDICATOR
44	LH VERTICAL CONSOLE CONTROL PANEL
45	LEFT COCKPIT ECS LOUVER
46	EMERG JETT SWITCH
47	INTERNAL CANOPY JETT LEVER
48	ECM DISP SWITCH
49	GEN TIE CONTROL PANEL ASSEMBLY
50	GND PWR CONTROL PANEL ASSEMBLY
51	FIRE TEST PANEL
52	THROTTLE QUADRANT CLOSURE PANEL
53	EXT LT CONTROL PANEL ASSEMBLY
54	INTR WING SWITCH

Figure 4. Cockpit Orientation - 163985 AND UP (Sheet 5)

INDEX NO.	NOMENCLATURE
55	FUEL SYSTEM CONTROL PANEL
56	FCS CONTROL PANEL C-10406/ASW-44
57	INTERCOMMUNICATION AMPLIFIER-CONTROL
[1]▶58	OXYGEN ON/OFF VALVE
[1]▶59	LIQUID OXYGEN QUANTITY INDICATOR GMU-75/A
60	ANTI-G SUIT DISCONNECT
61	VENT SUIT AIR HOSE ASSEMBLY
62	AIRCRAFT/SEAT OXYGEN DISCONNECT
63	COMM RECEPTACLE
[1]▶64	PILOT SERVICES CONTROL PANEL ASSEMBLY
65	ANTI-G VALVE
66	MC/HYD ISO CONTROL PANEL ASSEMBLY
67	NUC WPN SWITCH PANEL ASSEMBLY
68	ANT SEL CONTROL PANEL ASSEMBLY
69	CANOPY ACTUATOR MANUAL DRIVE UNIT
70	LH ESSENTIAL CIRCUIT BREAKERS CONTROL PANEL ASSEMBLY
71	APU CONTROL PANEL
72	E/U BATT VOLTMETER
73	ELEC POWER CONTROL PANEL ASSEMBLY
74	DEFOG CONTROL ASSEMBLY
75	INTERNAL CANOPY CONTROL SWITCH
76	RH ESSENTIAL CIRCUIT BREAKERS CONTROL PANEL ASSEMBLY
77	LIGHT SUPPORT AND MAD COMPENSATOR PANEL ASSEMBLY
78	MAP AND DATA CASE
79	NIGHT VISION GOGGLES STOWAGE CASE
80	FAN TEST CONTROL PANEL ASSEMBLY
81	DELETED
82	KY-58 CONTROL PANEL ASSEMBLY OR BLANK PANEL
83	SNSR POD CONTROL BOX PANEL ASSEMBLY
84	AMAC CONTROL
85	INTR LT CONTROL BOX PANEL ASSEMBLY
86	ECS PANEL ASSEMBLY
87	AIRCRAFT CONTROLLER GRIP ASSEMBLY
88	AIRCRAFT CONTROLLER GRIP ADAPTER ASSEMBLY
[2]▶89	OBOGS CONTROL SWITCH
[2]▶90	OBOGS CONTROL PANEL
[2]▶91	OXY FLOW CONTROL VALVE

LEGEND

[1] ▶ 163985 THRU 164068
[2] ▶ 164196 AND UP
[3] ▶ 164196 AND UP, USED WHEN RECONNAISSANCE SYSTEM INSTALLED
[4] ▶ 164945 AND UP
[5] ▶ 163985 THRU 164980
[6] ▶ 165171 AND UP
[7] ▶ BEFORE F/A-18 AFC 268
[8] ▶ AFTER F/A-18 AFC 268

Figure 4. Cockpit Orientation - 163985 AND UP (Sheet 6)

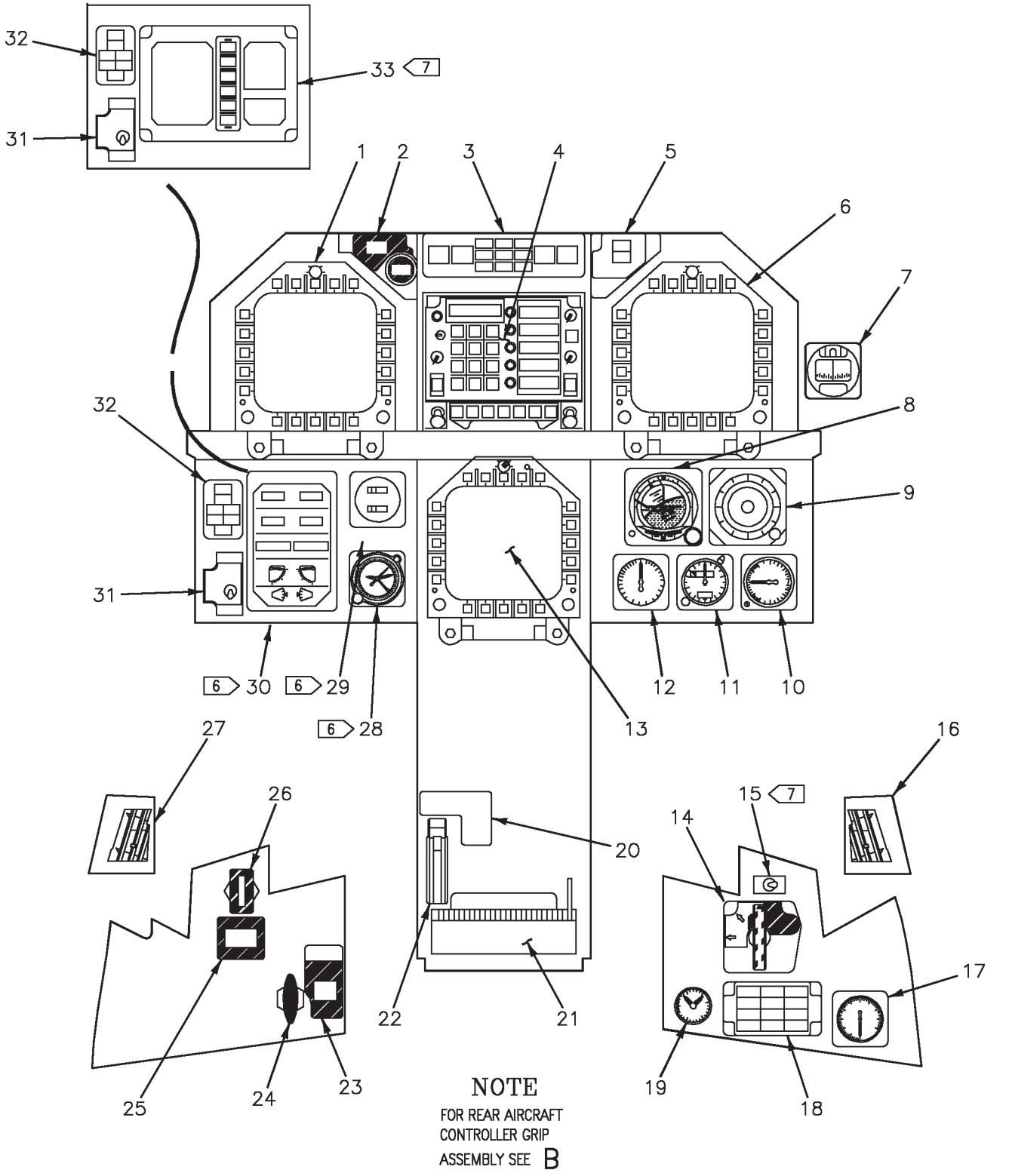

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Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 1)

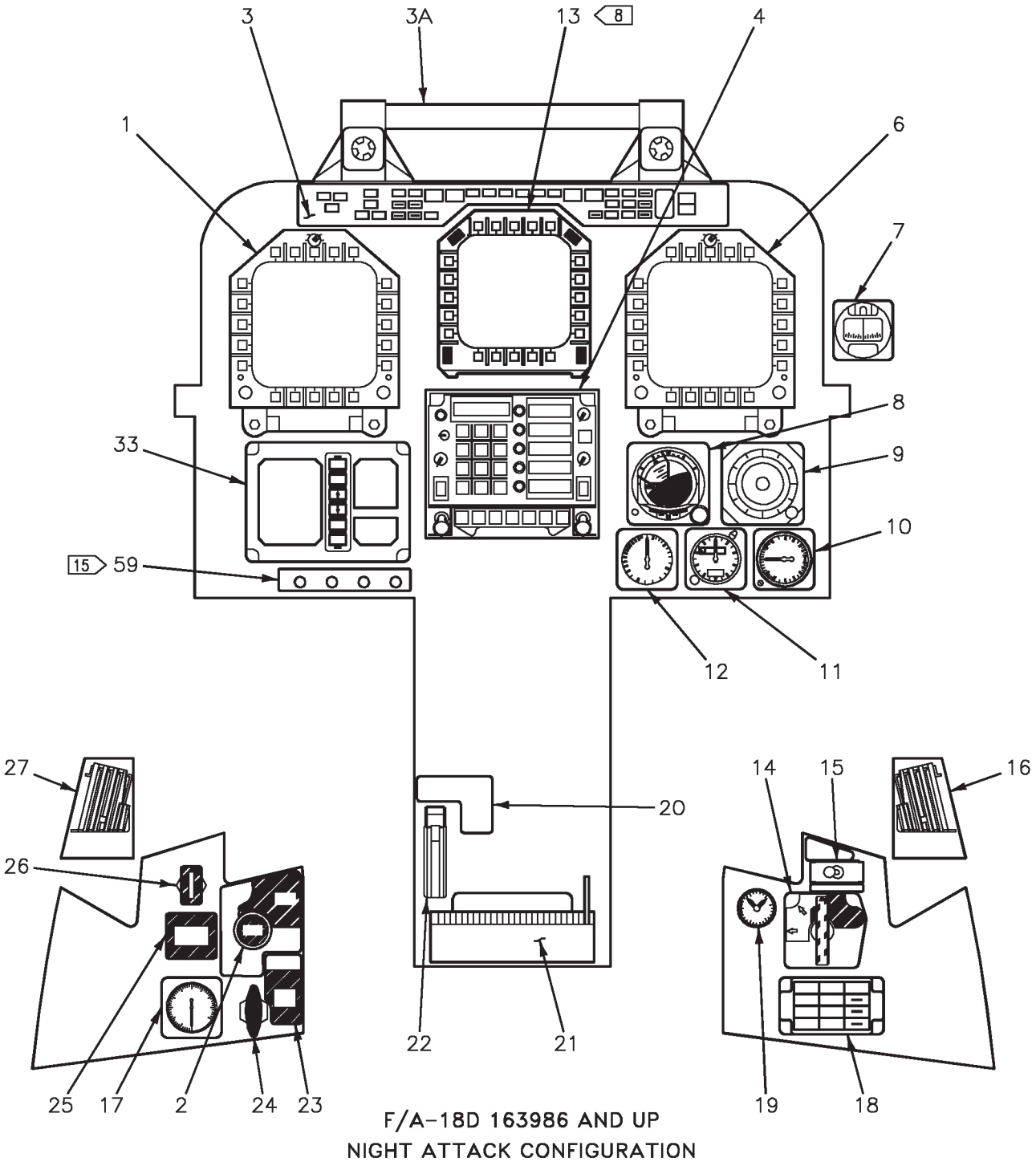
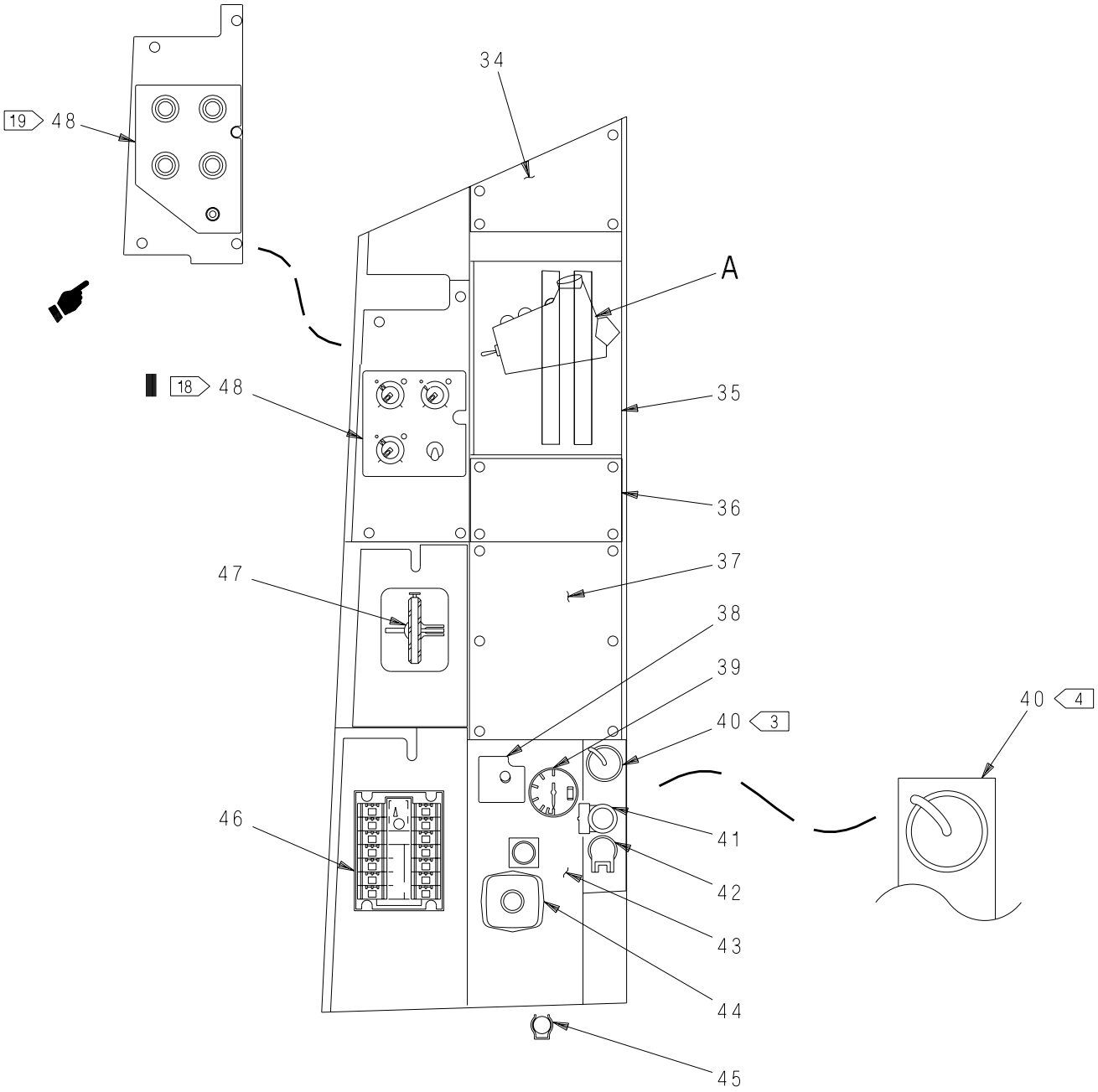


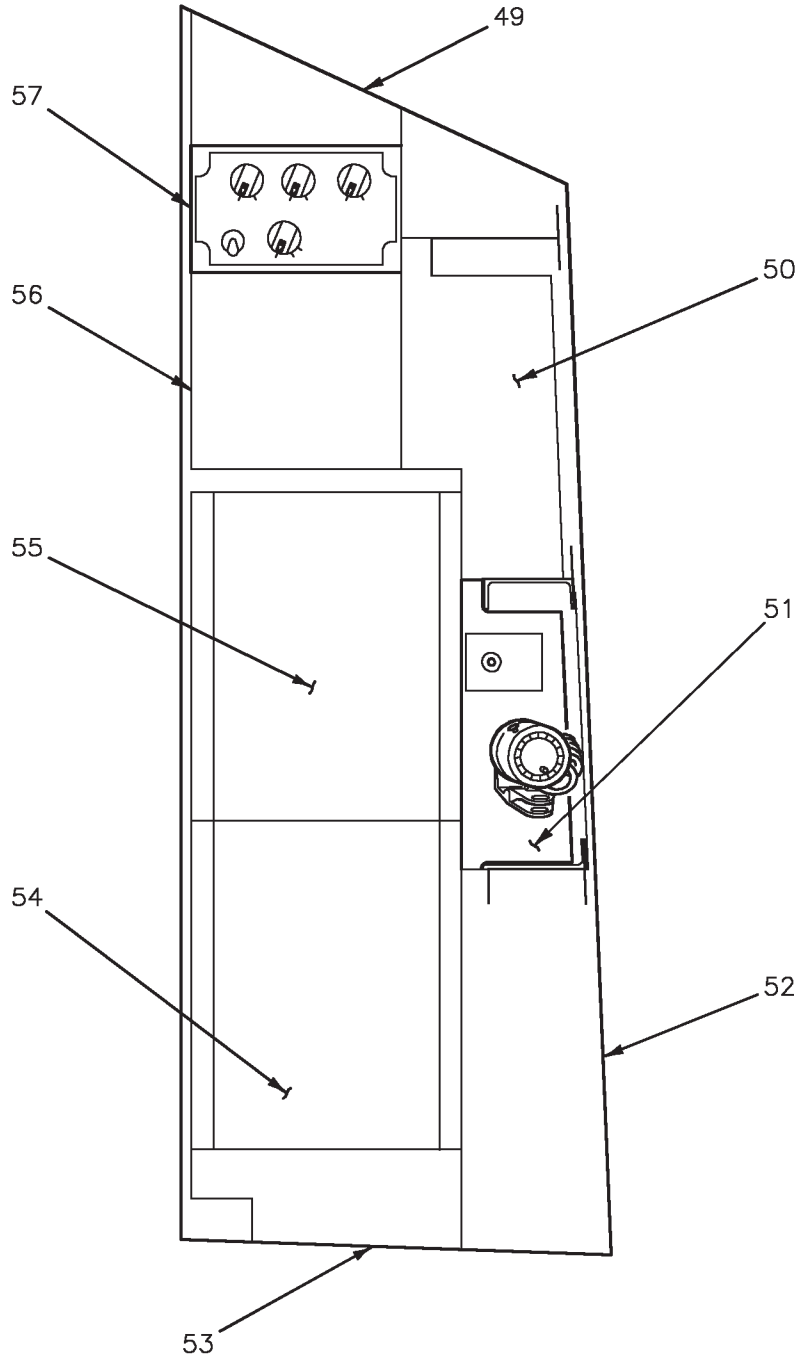
Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 2)



F/A-18B 161354 THRU 163123 AND
F/A-18D 163434 THRU 163778

ADA540-9-3-031

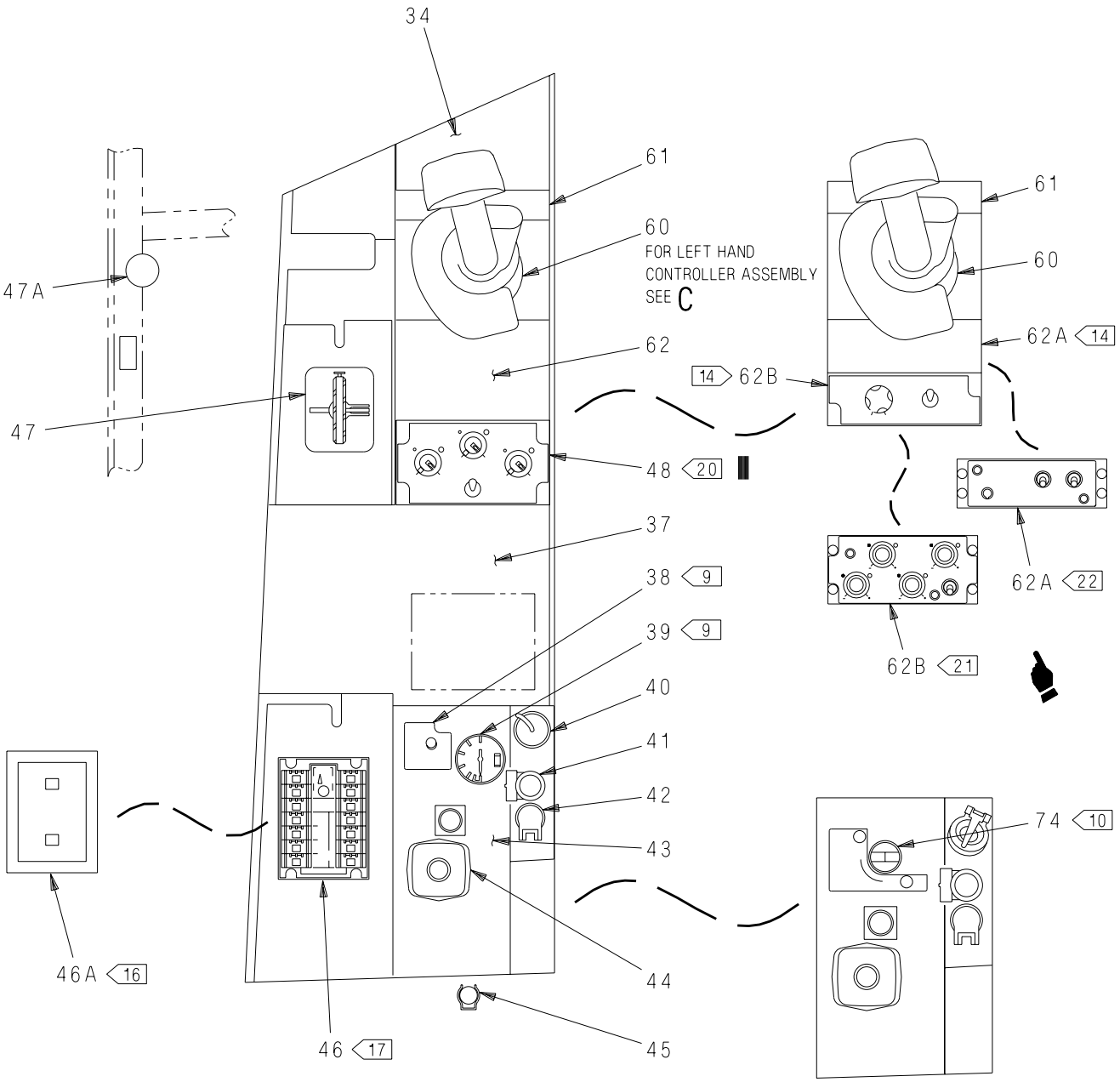
Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 3)



F/A-18B 161354 THRU 163123 AND
F/A-18D 163434 THRU 163778

18AC-GAI-00-(9-4)13-CATI

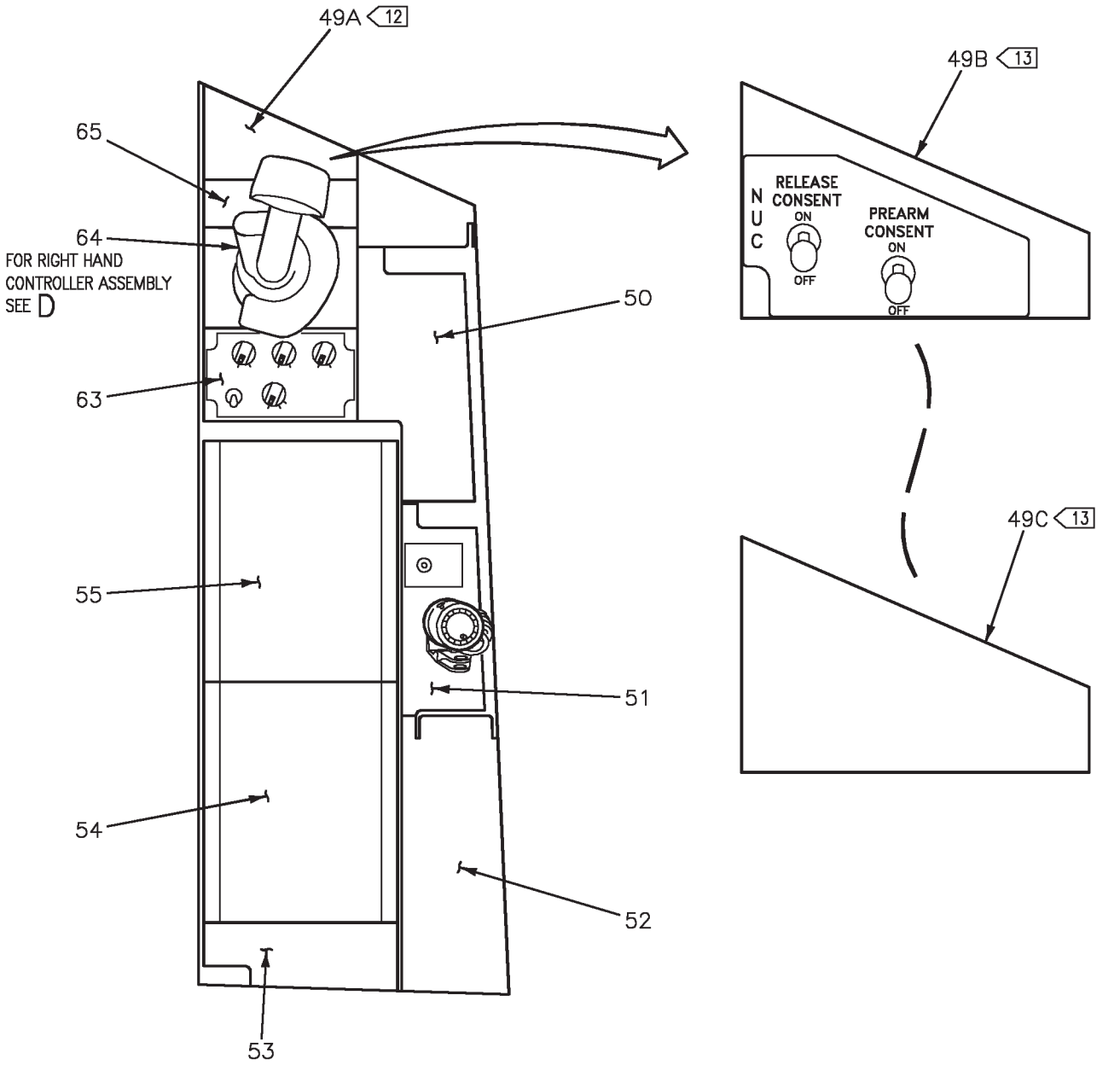
Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 4)



F/A-18D 163986 AND UP
NIGHT ATTACK CONFIGURATION

ADA540-9-5-031

Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 5)



F/A-18D 163986 AND UP
NIGHT ATTACK CONFIGURATION

18AC-GAI-00-(9-6)16-CATI

Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 6)

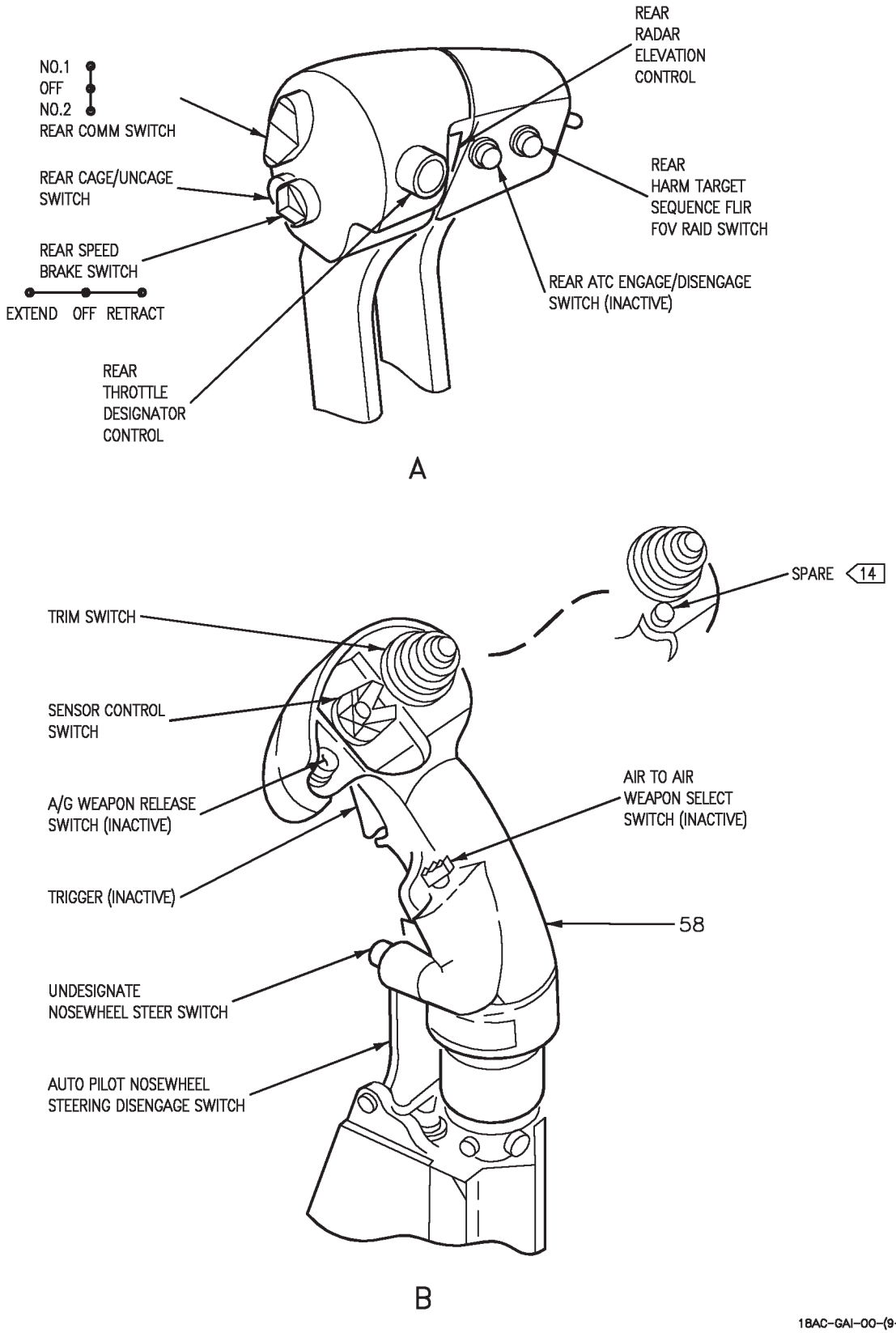


Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 7)

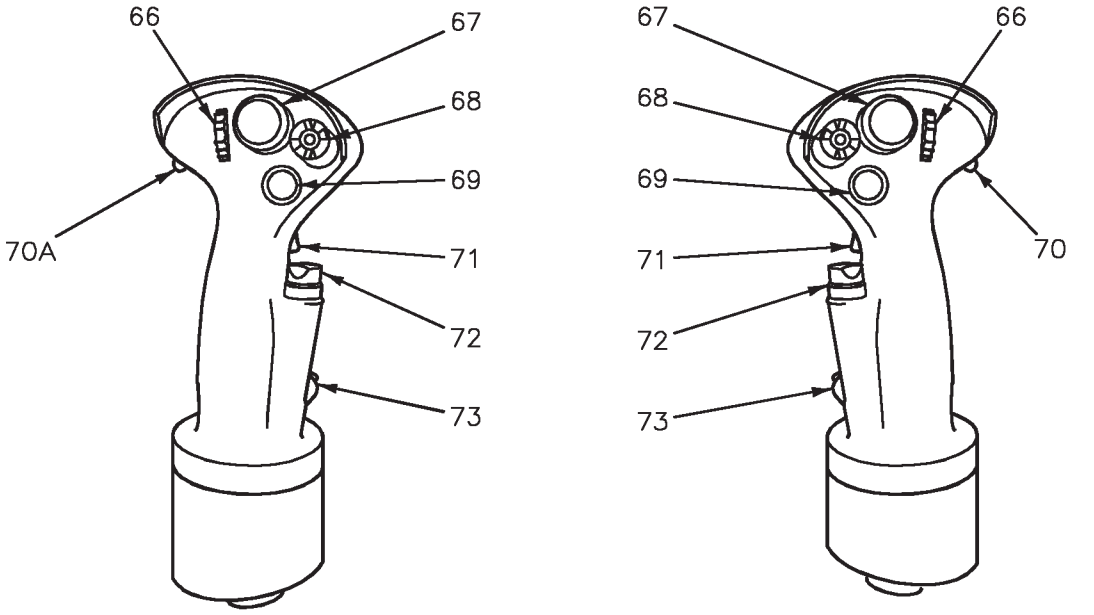


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Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 8)

	INDEX NO.	NOMENCLATURE
	1	REAR LEFT DIGITAL DISPLAY INDICATOR
	2	EMERG JETT PANEL ASSY
	3	REAR ADVISORY AND THREAT WARNING INDICATOR PANEL
	3A	CHAFF/FLARE HANDLE ASSEMBLY
	4	REAR ELECTRONIC EQUIPMENT CONTROL
	5	MASTER MODE SELECT PANEL ASSEMBLY
	6	REAR RIGHT DIGITAL DISPLAY INDICATOR
	7	REAR STANDBY COMPASS AQU-3/A
	8	REAR ATTITUDE REFERENCE INDICATOR ARU-48/A
1	9	BLANK PANEL
2		AZIMUTH INDICATOR OR BLANK PANEL
	10	REAR VERTICAL SPEED INDICATOR AVU-29/A
	11	REAR STANDBY PRESSURE ALTIMETER AAU-39/A
	12	REAR INDICATED AIRSPEED INDICATOR AVU-30/A
11	13	REAR CENTER DISPLAY INDICATOR
8		MULTI-COLOR PURPOSE DISPLAY
	14	EJECTION SEAT MODE SELECTOR
7	15	SEAT CAUTION MODE SWITCH 25S-L007
	16	RIGHT REAR ECS LOUVER
	17	REAR PRESSURIZED COMPARTMENT ALTIMETER AUU-30/A
	18	REAR CAUTION LIGHT INDICATOR PANEL
	19	HYDRAULIC PRESSURE INDICATOR AGU-15/A
	20	REAR BUNO LIGHT PANEL
	21	CENTER REAR COCKPIT ECS LOUVERS
	22	HANDLE-POS ADJ, RUDDER PEDAL
	23	EMERG BRK LIGHT PANEL
	24	EMERG BRK/PARK BRK CONTROL
	25	EMERG LDG GEAR LIGHT PANEL
	26	EMERG LDG GEAR CONTROL
	27	LEFT REAR ECS LOUVER
6	28	MECHANICAL AIRCRAFT CLOCK ABU-24/A
6	29	FUEL QUANTITY REPEATER INDICATOR
6	30	REAR CREW STATION ENGINE MONITOR INDICATOR AEU-12/A
5	31	COCKPIT DISPLAY SELECT PANEL
	32	LANDING GEAR AND FLAPS INDICATOR PANEL
7	33	INTEGRATED FUEL-ENGINE INDICATOR ID-2389/A
	34	BLANK PANEL
	35	REAR THROTTLE QUADRANT CLOSER PANEL
11	36	BLANK PANEL
8	37	INTERNAL DOOR CPAJ
11		AWS-25 CONV RCVR MOUNTING PANEL ASSY
9	38	REAR OXYGEN ON/OFF VALVE
9	39	REAR LIQUID OXYGEN QUANTITY INDICATOR GMU-76/A
	40	REAR ANTI-G SUIT DISCONNECT
	41	REAR VENT SUIT AIR HOSE ASSEMBLY
	42	REAR OXYGEN BREATHING HOSE ASSEMBLY
	43	REAR PILOT SERVICES CONTROL PANEL ASSEMBLY
	44	REAR ANTI-G VALVE
	45	REAR COMM RECEPTACLE
17	46	PROGRAMMER
16	46A	ALE-47 PROGRAMMER
	47	REAR INTERNAL CANOPY JETT LEVER
	47A	REAR ECM DISP SWITCH
20	48	VOLUME CONTROL PANEL ASSEMBLY
	49	BLANK PANEL
12	49A	BLANK PANEL

Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 9)

INDEX NO.		NOMENCLATURE
13	49B	AFT NUC CONSENT CONTROL PANEL
13	49C	AFT NUCLEAR CONSENT DUMMY PANEL
	50	BLANK PANEL
	51	FAN TEST CONTROL AND UTILITY LIGHT PANEL ASSEMBLY
	52	MAP AND DATA CASE
	53	BLANK PANEL
	54	REAR COCKPIT ELECTRIC LIGHT CONTROL
	55	COCKPIT ELECTRIC LIGHT CONTROL
	56	BLANK PANEL
	57	REAR INTR LT CONTROL BOX PANEL ASSEMBLY
	58	REAR AIRCRAFT CONTROLLER GRIP ASSEMBLY
8	59	REAR LH LOWER INSTRUMENT PANEL ASSEMBLY
8	60	LEFT HAND CONTROLLER
	61	BLANK PANEL
	62	BLANK PANEL
14	62A	BLANK PANEL
14	62B	RECCE CONTROL PANEL
21	62B	VOLUME CONTROL PANEL
22	62A	PTT COMM CONTROL PANEL ASSEMBLY
8	63	REAR INTR LT CONTROL BOX PANEL ASSEMBLY
8	64	RIGHT HAND CONTROLLER
	65	BLANK PANEL
8	66	RADAR ELEVATION CONTROL
8	67	THROTTLE DESIGNATOR CONTROL
8	68	SENSOR CONTROL SWITCH
8	69	SPARE
8	70	CHAFF/FLARE DISPENSER SWITCH
8	70A	ECM DISPENSE SWITCH
8	71	SPARE
8	72	HARM SEQ-CAGE/UNCAGE SWITCH-RAID/FOV SWITCH
8	73	UNDESIGNATE SWITCH
10	74	REAR OXY FLOW CONTROL VALVE

LEGEND

1 161354 THRU 161360
2 161704 AND UP
3 161354 THRU 162850
4 162857 AND UP
5 161704 AND UP; ALSO 161354 THRU 161360 AFTER F/A-18 AFC 54
6 161354 THRU 163123
7 163434 AND UP
8 F/A-18D 163986 AND UP; F/A-18D NIGHT ATTACK CONFIGURATION
9 161354 THRU 164068
10 164196 AND UP
11 161354 THRU 163778
12 F/A-18D 163986 THRU 164738 BEFORE F/A-18 AFC 160
13 F/A-18D 164866 AND UP; 163986 THRU 164738 AFTER F/A-18 AFC 160
14 F/A-18D 164279 AND UP
15 F/A-18D 163986 THRU 164901; F/A-18D NIGHT ATTACK CONFIGURATION
16 F/A-18D 165409 AND UP

Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 10)

LEGEND

17 F/A-18D 163986 THRU 164967
18 F/A-18B; ALSO F/A-18D 163434 THRU 163778 BEFORE F/A-18 AFC 268
19 F/A-18D 163434 THRU 163778 AFTER F/A-18 AFC 268
20 F/A-18D 163986 AND UP BEFORE F/A-18 AFC 268
21 F/A-18D 163986 AND UP AFTER F/A-18 AFC 268
22 F/A-18D 163986 AND UP AFTER F/A-18 AFC 270

Figure 5. Rear Cockpit Orientation F/A-18B AND F/A-18D (Sheet 11)

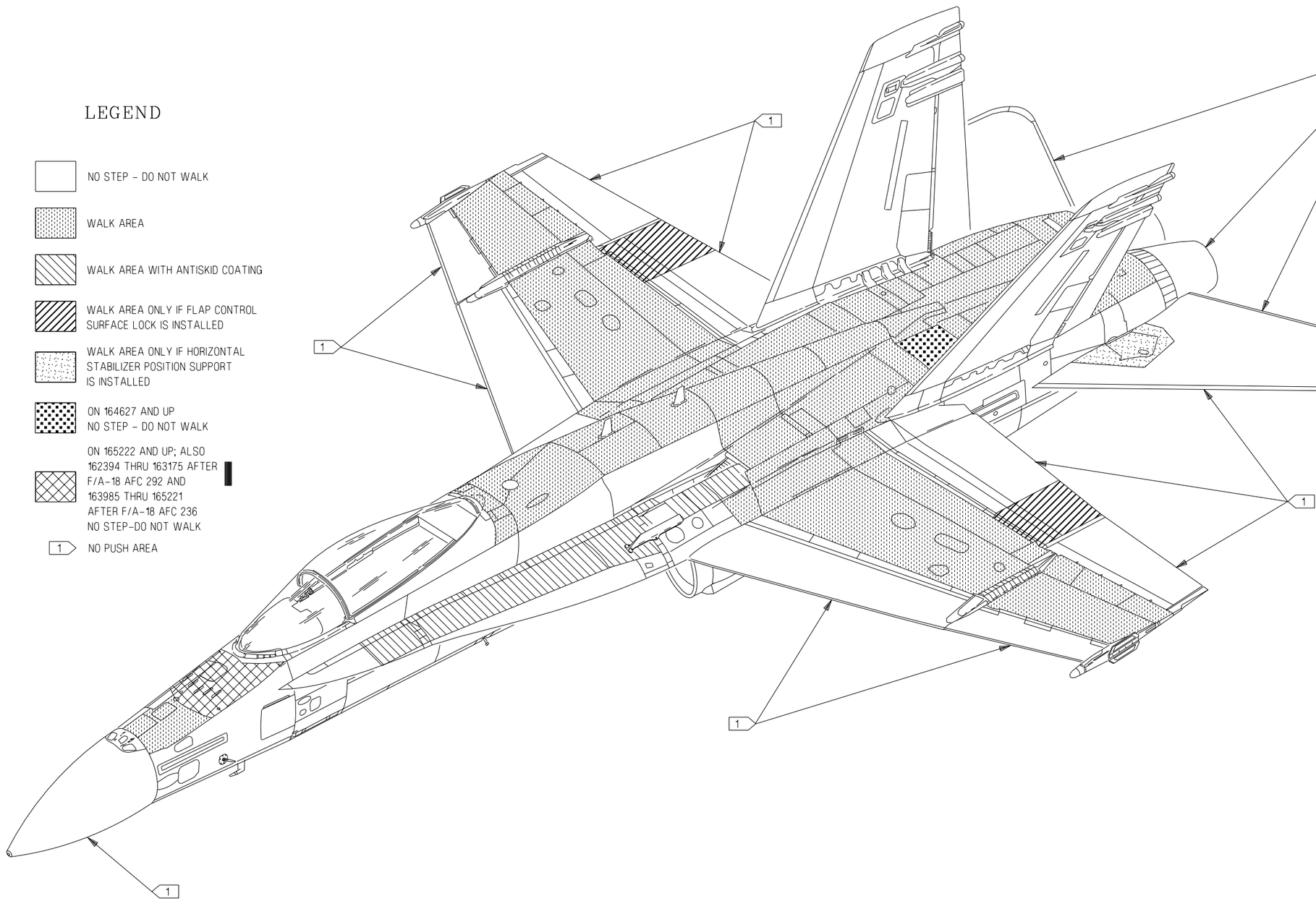
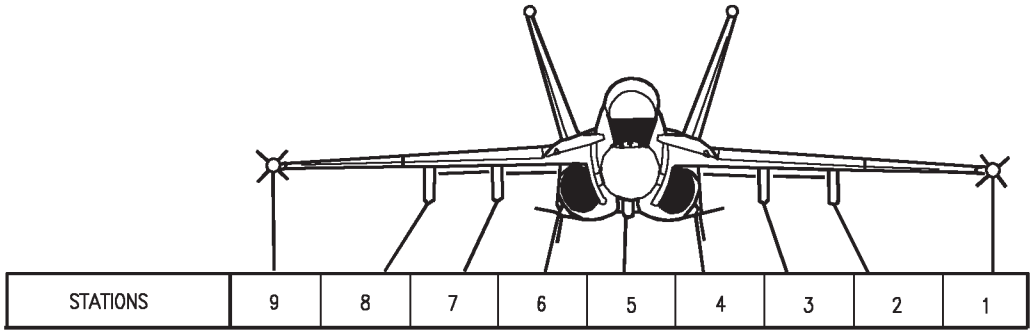


Figure 6.

Figure 6. Aircraft Walk Areas

ADA540-7-1-030

Figure 6.



18AC-GAI-00-(16-1)C-CATI

Figure 7. Aircraft Weapon/Stores Stations

ORGANIZATIONAL MAINTENANCE

SYSTEM DESCRIPTIONS

Reference Material

None

Alphabetical Index

Alphabetical Index (Continued)

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
ACC 446 REV A AMEND 1	12 Dec 85	Parachute Harness Sensing - Release Unit; Installation of (Purpose: To Correct an EPA Test Reading in Reference (e) and to Replace Figure 10 with an Updated Figure 10). (ECP CHINA LAKE 93)	1 Dec 86	-
F/A-18 AFC 27	1 Aug 90	Lead Edge Flap/Control Stick Changes, Incorporation of (ECP MDA-F/A-0044)	1 Feb 87	-
F/A-18 AFC 54	1 Aug 92	Incorporation of a Video Recording Set (ECP MDA-F/A-18-00027)	1 Feb 87	-
F/A-18 AFC 57	1 Sep 90	Improved Aircraft Monitor and Control (AMAC), Installation of (ECP MDA-F/A-18-00087)	1 Feb 87	-
F/A-18 AFC 20	1 Sep 86	Provisions for Electronic Boresighting of Radar (ECP MDA-F/A-18-00050)	1 Feb 87	-
F/A-18 AFC 48	1 Jul 92	Automatic AC Bus Isolation, Installation of (ECP MDA-F/A-18-00121)	1 Feb 87	-
F/A-18 AFC 49	20 Feb 90	Sealed Lead Acid Battery, Addition of (ECP MDA-F/A-18-00074)	1 Feb 87	-
F/A-18 AFC 90	1 May 91	GFE Battery Relay Control Unit, Incorporation of (ECP-MDA-F/A-18-00165R1)	15 Feb 90	-
F/A-18 AFC 126	1 Oct 94	Addition of (DFIRS) Deployable Flight Incident Recorder Set (ECP 321R1C1)	1 Dec 92	-
F/A-18 AFC 160	3 Jan 93	Dual Cockpit Control Capability For Nuclear Missions (ECP-MDA-F/A-18-00426	1 Dec 91	-
F/A-18 AFC 175 PT 2	-	Miniaturized Airborne Global Positioning System (GPS) Receiver (MAGR) , Incorporation of (ECP-MDA-F/A-18-00405A1)	15 Mar 00	ECP Coverage Only
F/A-18 AFC 185	1 Feb 95	Incorporation of Havequick/Sincgars (ECP-MDA-F/A-18-00292R1A3R2)	15 Jun 94	-
F/A-18 AFC 211	-	AN/APG-65, Replacement With AN/APG-73 (ECP-MDA-F/A-18-00508)	1 Aug 95	ECP Coverage Only
F/A-18 AFC 231	-	Embedded GPS/INS Lot(s) 6-9 Acft (ECP-MDA-F/A-18-00521)	15 Mar 97	ECP Coverage Only

Record of Applicable Technical Directives (Continued)

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 236	-	Retrofit of Combined Interrogator/ Transponder (CIT) Identification Friend or Foe (IFF) System (ECP MDA-F/A-18-00520R1)	15 Mar 00	ECP Coverage Only
F/A-18 AFC 258	16 Jun 98	Crash Survivable Flight Incident Recorder (CSFIRS) Installation of, (ECP-MDA-F/A-18-00573)	1 Apr 00	-
F/A-18 AFC 253	31 Aug 00	U.S. Naval Reserves A+ Avionics Upgrade, Installation of	1 Oct 00	ECP Coverage Only
F/A-18 AFC 269	-	Digital Communications System (DCS), Incorporation of System, Provisions for (ECP-MDA-F/A-18-00576)	15 Jun 01	ECP Coverage Only
F/A-18 AFC 270	-	Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT), Incorporation of (ECP-MDC-F/A-18-00577)	15 Jun 01	ECP Coverage Only
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A+ Avionics Upgrade, Installation of	1 Oct 00	ECP Coverage Only

1. SEAT, CANOPY, SURVIVAL EQUIPMENT, WINDSHIELD AND BOARDING LADDER.

2. **EJECTION SEAT AND CANOPY EMERGENCY ESCAPE SEQUENCING.** On F/A-18A AND F/A-18C, seat ejection & canopy jettison sequencing is started by pulling the ejection control handle on the front of the ejection seat bucket, firing the ejection seat initiators.

Ballistic gas pressure produced by the right seat initiator does the below:

a. Actuates the pin puller.

b. Fires the gas to SMDC initiator which fires the IFF switch and the canopy jettison system by way of the one-way transfer valve.

c. Fires the inertia reel cartridge.

d. Fires the 0.30 second delay initiator.

Ballistic gas pressure from either delay initiator operates the catapult primary cartridge which starts seat ejection.

3. On F/A-18B AND F/A-18D, the emergency escape sequencing system provides for canopy jettison and ejection of seats in correct sequence. The selection of sequencing is made on the ejection selector in the rear cockpit. There are three selections:

a. Normal - When sequence is initiated from the cockpit, both seats are ejected with the rear seat first. When sequence is started from the rear cockpit only the rear seat is ejected.

b. Solo - Selection is used when the rear cockpit is not occupied; only the cockpit seat is ejected.

c. Aft Initiate - Both seats are ejected with the rear seat first when started from cockpit or rear cockpit.

4. On F/A-18C AND F/A-18D aircraft; the ejection seat (s) are equipped with an SAFE/ARM indicator switch which indicates the ejection seat (s) not being armed under certain conditions. On F/A-18D the rear cockpit is equipped with a seat caution mode switch which overrides the rear cockpit SAFE/ARM indicator switch for solo flight.

5. **Internal Canopy Jettison.**

Canopy jettison is started with the internal canopy jettison lever. On F/A-18A AND F/A-18C, the internal canopy jettison lever is mounted inboard and below the canopy sill found in the left side of the cockpit. The lever is operated by pushing down on the safety button and rotating lever aft. Aft rotation of the lever fires the canopy jettison initiator which in turn jettisons the canopy.

6. On F/A-18B AND F/A-18D, canopy jettison is started with either the internal canopy jettison lever or the rear internal canopy jettison lever.

Cockpit internal canopy jettison:

a. Same as F/A-18A AND F/A-18C

b. Rear cockpit canopy jettison is located in the center of the left console.

The lever is operated by pushing in on safety button and pulling up. Pulling up on rear internal canopy jettison lever fires the rear canopy jettison initiator which in turn jettisons the canopy.

7. **External Canopy Jettison - 161353 THRU 162477.**

Ground emergency jettison of the canopy is started by external canopy jettison handles which are in back of doors 5L & 5R. Each handle is attached to approximately eight feet of cable. The cables are joined to a common cable that connects to the internal canopy jettison lever. When either handle is pulled and the cable extended as far as possible, the canopy jettison initiator fires which in turn jettisons the canopy.

8. **EJECTION SEAT SYSTEM.** On 161353 THRU 164068, the SJU-5/A ejection seat is fitted to the F/A-18A, F/A-18C and in the rear cockpit of the F/A-18B AND F/A-18D aircraft. The SJU-6/A ejection seat is fitted to the cockpit of the F/A-18B AND F/A-18D.

9. On 164196 AND UP, the SJU-17(V)1/A ejection seat is fitted to the F/A-18C and the rear cockpit of the F/A-18D aircraft. The SJU-17(V)2/A ejection seat is fitted to the cockpit of the F/A-18D.

10. The ejection seat provides support for the crewmember during normal flight conditions and a method of escape from the aircraft during emergency conditions. The ejection seat is automatic, cartridge operated and rocket assisted.

11. The ejection seat system is made up of the main beam, parachute, seat bucket, survival kit and catapult.

12. Ejection is initiated by pulling the ejection control handle located on the front of the seat bucket. The parachute container is fitted with canopy breakers to enable the seat to eject through the canopy should the canopy fail to jettison. Parachute deployment and Man/Seat separation are automatic after ejection. A manual override system is provided for possible failure of the automatic system.

13. The seat is ejected by means of gas pressure developed in the catapult when the proper cartridges are ignited. A rocket motor, mounted under the seat bucket, is fired as the catapult reaches the fully extended position. This supplies additional upward thrust to carry the seat to a sufficient height to enable the parachute to deploy, even if ejection is initiated at zero speed, zero altitude in level attitude.

14. The seat is stabilized and the forward speed retarded after ejection by a drogue system followed by automatic deployment of the personnel parachute and separation of the crewmember from the seat.

15. On ejection seats after ACC 446 REV A AMEND 1, an automatic backup method of releasing the parachute canopy when landing in sea water following an emergency ejection is installed (SEAWARS).

16. **CANOPY SYSTEM.** The cockpit area is enclosed by a clamshell type canopy. The main components of the canopy system are:

a. Electro - mechanical canopy actuator.

b. Canopy unlatch thruster.

c. Canopy jettison rocket motors.

17. On F/A-18A AND F/A-18C, latching provisions consist of three latch hooks on lower canopy frame, left and right sides, and index pins on lower leading edge of canopy frame.

18. On F/A-18B AND F/A-18D, latching provisions consist of four latch hooks on lower canopy frame, left and right sides, and index pins on lower leading edge of canopy frame.

19. When canopy is closed and locked, latch hooks and index pins engage retainers on fuselage. The canopy is held in the forward, locked position by over-center rotation of the canopy actuator and connecting link. An additional lock is provided by a mechanical brake within the canopy actuator.

20. Cockpit pressure is retained by an inflatable canopy pressure seal around the canopy frame. A weather seal is provided outboard of the canopy pressure seal to keep rain out of the cockpit when canopy is closed and canopy pressure seal is deflated.

21. **Normal Control Mode.** The canopy is electrically operated by means of an external canopy control switch and an internal canopy control switch. With no generator or external power applied to the aircraft, battery power is available for at least five open/close cycles of the canopy.

22. External canopy control switch is located inside the external power receptacle door (Door 9) on the left side of the aircraft. To open canopy, set switch to OPEN, and manually hold until canopy fully opens and stops. Release switch, and it returns to HOLD. To close canopy, set switch to CLOSE, and manually hold until canopy fully closes and locks. Release switch, and it returns to HOLD. Canopy may be stopped at any position between full open and full close by releasing switch, which returns to HOLD.

23. Internal canopy control switch is located on right side of cockpit, under canopy sill. To close canopy, set switch to CLOSE, and manually hold until canopy fully closes and locks. Release switch, and it returns to HOLD. To open canopy, set switch to OPEN and release. The switch is magnetically held in the OPEN position until the canopy raises to full open and stops. The switch then returns to HOLD. Canopy may be stopped at any point during closing by releasing switch. Canopy may be stopped at any point during opening by manually setting switch to HOLD.

24. **Backup Manual Control Mode.** If no electrical power is available for canopy operation, a back-up crank system is provided to manually power the canopy actuator. Internally, the manual crank is under the left canopy sill. Externally, manual handcrank provisions are provided by a drive socket located flush on the mold line, outside of the internal handcrank. On F/A-18A AND F/A-18C, internally, 70 crank turns are required to fully open the canopy; externally, 35 crank turns are required. On F/A-18B AND F/A-18D, internally, 224 crank turns are required to fully open the canopy; externally, 112 crank turns are required.

25. **WINDSHIELD.** The windshield is made of formed stretched acrylic, mounted in a metal frame. A non-inflatable, preformed pressure seal is installed on the lower side of the frame to allow cockpit pressurization and prevent entry of rain water into the cockpit. The windshield is attached to the fuselage by two hinge arms at the forward end. The hinges allow the windshield to be opened

and tilted forward for maintenance on systems and/or components in back of the cockpit main instrument panel. A cable lanyard assembly prevents the windshield from over rotating and damaging the acrylic-transparency during opening.

26. **BOARDING LADDER.** The boarding ladder provides access to the cockpit and upper areas of the aircraft. Boarding ladder extension and stowage is done from ground/deck level only. The boarding ladder is extended when the forward and aft latches are released, allowing the ladder to rotate down to extended position. A telescoping drag brace prevents immediate full extension, and when fully extended, locks to provide longitudinal stability. Lateral stability is provided by a fuselage side brace. The boarding ladder is manually retracted aft into the left leading edge extension (LEX). The forward and aft latches are fully engaged and locked by pushing full up until flush with boarding ladder forward beam. With electrical power on the aircraft and the boarding ladder not stowed, a LADDER caution is displayed on the cockpit left digital display indicator (DDI) and the MASTER CAUTION comes on.

27. LANDING GEAR AND RELATED SYSTEMS.

28. **LANDING GEAR.** The landing gear is electrically controlled and hydraulically operated. Before the gear can be raised normally, weight must be off the wheels and the launch bar must be retracted. The main gear is retracted aft and inboard into the fuselage and the nose gear is retracted forward. When the gear is extended all gear doors remain open.

29. **LDG GEAR Control Handle.** The landing gear is controlled by a two-position, wheel-shaped LDG GEAR control handle, located above LH vertical console control panel. Moving the LDG GEAR control handle up (with hydraulic and electrical power applied) raises the gear. Moving the LDG GEAR control handle down lowers the gear. On the ground (weight on wheels), movement of the LDG GEAR control handle from DN to UP is prevented by a solenoid in the LDG GEAR control panel. However, a down lock override button next to the LDG GEAR control handle makes it possible to override the weight on wheels switch and retract the MLG, if a failure has occurred in the lock down solenoid circuit. In this case, the override button allows the LDG GEAR control handle to be raised. During maintenance with electrical power applied, the LDG GEAR control handle can be raised without pressing the override button with aircraft on jacks (weight off wheels) and proximity switch control not connected.

30. **Landing Gear Warning Lights.** The landing gear warning lights are made up of a red light in the LDG GEAR control handle and on F/A-18B AND F/A-18D, the UNSAFE light in the rear cockpit. The landing gear warning lights come on if any of the following conditions below exist:

a. Handle light comes on steady when gear position does not agree with handle position.

b. Handle light comes on steady when LDG GEAR control handle is DN and L MLG or R MLG planing link is not locked.

c. Inflight, handle light flashes 3 to 5 times per second when LDG GEAR control handle is in UP position and air data computer senses altitude less than 7,500 feet, rate of descent more than 250 feet per minute, airspeed less than 175 knots, and aircraft has been weight-off-wheels for more than 10 seconds.

d. During air data computer maintenance BIT with LDG GEAR control handle in UP (not inflight) position, handle light will flash 3 to 5 times per second.

e. On aircraft with landing gear control unit P/N 8-347-03 or 8-347-04 installed, handle light comes on steady when left or right planing link switch fails BIT.

f. On aircraft with landing gear control unit P/N 8-347-03 or 8-347-04 installed, handle light comes on steady when left or right planing link switch input to landing gear control unit is incorrect when LDG GEAR control handle is set to DN. This condition is delayed until related MLG is down and locked.

g. On F/A-18B AND F/A-18D, the red unsafe light in the rear cockpit comes on when landing gear is in transit and remains on until all gear are locked in a position that agrees with LDG GEAR control handle position (UP or DN).

31. **Landing Gear Warning Tone.** The Landing Gear Warning Tone will sound in headset 3 to 5 times per second if any of the following conditions below exist:

a. Inflight, when LDG GEAR control handle is in UP position and air data computer senses altitude less than 7,500 feet, rate of descent more than 250 feet per minute, airspeed less than 175 knots, and aircraft has been weight-off-wheels for more than 10 seconds.

b. Air data computer in maintenance BIT (not inflight) and LDG GEAR control handle in UP position.

c. On aircraft with landing gear control unit P/N 8-347-03 or 8-347-04 installed, when left or right planing link switch fails BIT.

d. On aircraft with landing gear control unit P/N 8-347-03 or 8-347-04 installed, when LDG GEAR control handle light is on for more than 15.0 ± 0.5 seconds.

e. On aircraft with landing gear control unit P/N 8-347-03 or 8-347-04 installed, when left or right planing link switch input to landing gear control unit is incorrect when LDG GEAR control handle is set to DN. This condition is delayed until related MLG is down and locked.

f. On F/A-18A AND F/A-18C with landing gear control unit 8-347-03 or 8-347-04 installed, during lamp test.

32. **Landing Gear Position Lights.** There are three green landing gear position lights marked NOSE, LEFT, and RIGHT, above the landing gear control handle and also on F/A-18B AND F/A-18D rear cockpit main instrument panel. Each light comes on when its respective gear is down and locked.

33. On aircraft with landing gear control unit P/N 8-347-01 installed, the LEFT or RIGHT light will flash if its respective planing link is not locked.

34. On aircraft with landing gear control unit P/N 8-347-03 and 8-347-04 installed, the LEFT and RIGHT downlock light flashes if either planing link is not locked.

35. On aircraft with landing gear control unit P/N 8-347-04, the LEFT or RIGHT downlock light flashes if either planing link switch fails power up BIT.

36. On aircraft with landing gear control unit P/N 8-347-03 and 8-347-04 installed, the LEFT or RIGHT downlock lights flashes if either planing link switch fails BIT.

37. On aircraft with landing gear control unit P/N 8-347-03, if left or right planing link switch input to the landing gear control unit is incorrect when the landing gear control handle is set to DN, LEFT or RIGHT light will come on, landing gear warning lights will remain on and tone sounds. This condition is delayed until the MLG is down and locked. This condition provides a positive indication of planing link switch function.

38. **Landing Gear Emergency Extension.** Emergency gear extension is activated by rotating the LDG GEAR control handle 90° clockwise and pulling (approximately 1.5 inches) until the handle locks in place. This can be done with the handle in either UP or DN; however, the handle must be rotated 90° before it is pulled. Rotating and pulling the gear handle, positions the NLG and MLG control valves to neutral, porting all normal hydraulic system pressure to return. Emergency hydraulic pressure from the APU and emergency brake accumulators unlocks the landing gear doors and the landing gear. Landing gear emergency extension is primarily free fall with landing gear downlock provided by emergency hydraulic pressure to the NLG drag brace and MLG downlock actuators.

39. **WHEEL BRAKE AND ANTI SKID SYSTEM.**

40. **Brakes.** The main landing gear wheels have full power brakes operated by toe action on the rudder pedals. An anti skid system is combined with the normal system to prevent wheel skid. With anti skid ON, a touchdown protection circuit prevents brake application until 5 seconds after aircraft touchdown.

41. **Anti Skid.** The anti skid system is electrically controlled by a two position switch on the lower left portion of the instrument panel. The switch is lever-locked to OFF. An advisory ADV-SKID display on the Left Digital Display Indicator is displayed if the landing gear is down and anti skid ON is not selected. If anti skid fails, the Left Digital Display Indicator displays ANTISKID as a caution and the MASTER CAUTION light comes on. The anti skid system is disabled below 35 knots to allow taxiing and turning operation. Also, anti skid is not available when the emergency brake system is activated.

42. **EMERG BRK/PARK BRK Control.** The combination EMERG BRK/PARK BRAKE control

is on the lower left corner of the main instrument panel. The handle is shaped such that "EMERG" is visible to the pilot when the handle is in the stowed or emergency position and "PARK" is visible to the pilot when the handle is rotated counterclockwise to the park position.

43. **Emergency Brakes.** The emergency brake system uses normal system brakes with independent hydraulic lines carrying emergency hydraulic pressure to the brake shuttle valve. The emergency brakes are supplied with hydraulic pressure by the brake accumulator backed up by the APU accumulator. Brake accumulator pressure is shown on a pressure gage on the lower left corner of the main instrument panel. When brake accumulator pressure is low, BRK ACCUM is displayed on the Left Digital Display Indicator as a caution and the MASTER CAUTION light comes on. The system is activated by pulling the EMERG BRK/PARK BRK control out to detent. This action routes brake accumulator pressure to the disc brakes, proportionally to pilot input through toe action on the rudder pedals. The system is deactivated by pushing the EMERG BRK/PARK BRK control back into the stowed position.

44. **Parking Brakes.** The parking brake system uses the same hydraulic lines, accumulators and actuation handle as the emergency brake system. The system is activated by rotating the EMERG BRK/PARK BRK control 90° counterclockwise from the horizontal stowed position and pulling it out to a positive locked position. If the emergency brakes have been activated, it will be necessary to reposition the handle to the stowed position then rotate it 90° counterclockwise and pull it to the locked position to select parking brakes. This action applies non-regulated pressure to the disc brakes. With the INS on, the parking brake set, the PARK BRK caution and the MASTER CAUTION come on when both engine throttles are advanced. To release the parking brake, rotate the EMERG BRK/PARK BRK control 45° counterclockwise from the extended position. This releases the lock and allows the handle to return to the horizontal stowed position.

45. **ARRESTING GEAR SYSTEM.** The arresting hook system is made up of a retract actuator/damper, fail safe manual latch and release, universal hook shank pivot and replaceable hook point. Hook control is a manual system which automatically extends the hook in case of a failure of the release system. The arresting hook control handle and hook light are on the lower right main instrument panel. The light remains on except when the hook is up and latched or is fully down. Hook extension is a free-fall action assisted by a nitrogen charge in the actuator cylinder. Hook motion is dampened laterally by a liquid spring in the hook shank and vertically by the damper in the retract actuator cylinder which minimizes hook bounce and provides hold down force for arresting cable engagement.

46. **ARRESTING HOOK MANUAL CONTROL LEVER.** To extend the arresting hook, place the arresting hook control handle down. The HOOK light will be on anytime the arresting hook and the arresting hook control handle are not in the same position (both down or both up). The light remains on if the hook is in contact with the deck and is prevented from reaching the hook down proximity switch. To retract the arresting hook, place the arresting hook control handle up.

47. **CATAPULT SYSTEM.** A two position (EXTEND and RETRACT) LAUNCH BAR control switch on the LH vertical console control panel controls launch bar operation. The launch bar is hydraulically extended and mechanically retracted by the launch bar power unit. When weight is on the NLG, the LAUNCH BAR control switch is set to EXTEND and the launch bar is extended. The green L BAR advisory light comes on. The launch bar is held against the deck by the launch bar power unit. The launch bar power unit allows vertical movement of the launch bar during taxi. As the aircraft is taxied into the catapult, the launch bar drops over the shuttle and is held captive in the extended position as the shuttle is tensioned. On 161353 THRU 161715, when both throttles are advanced to or above MIL power, the LAUNCH BAR control switch is deenergized and returns to RETRACT. When the LAUNCH BAR control switch is set to or returns to RETRACT, the green L BAR advisory light goes out. On 161353 THRU 161715, if the LAUNCH BAR control switch is not deenergized to RETRACT after the throttles are advanced to MIL, the red L BAR warning light comes on. At the completion of the catapult stroke, the launch bar retracts allowing the nose landing gear to be retracted. If the LAUNCH BAR control switch is set to EXTEND, when the NLG extends after take off the LAUNCH BAR control switch is deenergized, and launch bar power unit retracts the launch bar. If the launch bar fails to retract after

the aircraft is launched, the red L BAR warning light comes on. A LAUNCH BAR circuit breaker on the LH essential circuit breakers control panel assembly provides an electrical system override and when pulled it deenergizes the launch bar electrical system allowing the launch bar to retract.

48. SECONDARY POWER SYSTEM.

49. The secondary power system is made up of the Auxiliary Power Unit (APU), Airframe Mounted Accessory Drive (AMAD), Secondary Power Compressed Air System, Fire Detection System, and Fire Extinguishing System.

50. **AUXILIARY POWER UNIT (APU) SYSTEM.** The APU is an airframe mounted gas turbine engine that has a hydraulic start motor which is powered by an accumulator, a self-contained lubrication and ignition system, and an airframe supplied fuel system. During operation, APU pneumatic air is used to start or motor a main engine or to drive an airframe mounted accessory drive (AMAD) for ground checkout of the aircraft hydraulic, electrical, and fuel systems. The APU pneumatic air may also be used for ground checkout of the environmental control system (ECS) or to supply the ECS during single-engine operation.

51. **AIRFRAME MOUNTED ACCESSORY DRIVE (AMAD) SYSTEM.** The left and right AMADs are gearboxes that are powered by an air turbine starter (ATS) or an engine-driven power transmission shaft (PTS). Each AMAD drives a hydraulic pump, generator, and motive flow/boost pump. Each AMAD has a self-contained lubrication system that is also used to cool its corresponding generator. There are three modes of AMAD operation: engine start, engine driven, and ground maintenance. During the engine start mode, pneumatic air from the APU, engine or external air source rotates the ATS. The ATS powers the AMAD which then rotates the PTS to either motor or start the engine. During the engine driven mode, the PTS powers the AMAD which in turn drives its corresponding accessories. During the ground maintenance mode,the PTS is decoupled from the AMAD and pneumatic air from the APU or external air source powers the ATS. The ATS powers the AMAD which drives the accessories without rotating the engine.

52. **SECONDARY POWER COMPRESSED AIR SYSTEM.** The secondary power compressed air system provides pneumatic power for operating the air turbine starter (ATS) or the environmental control system (ECS). During APU operation, compressed air is routed to the ATS to drive either AMAD or to the ECS for cooling. An air connection in the right wheelwell allows use of an external air source for system operation. The secondary power compressed air system may also be used to crossbleed compressed air from one main engine to start or motor the second main engine.

53. **FIRE DETECTION SYSTEM.** The fire detection system is a dual-loop system that provides fire warning for the APU bay, left and right AMAD bays and the left and right aft engine bays. The left and right forward engine bays only, have a single-loop detection system. A fire condition in either engine or AMAD bay is indicated by a left or right FIRE warning light. A fire condition in the APU bay is indicated by an APU FIRE warning light. When a fire condition is detected a voice alert of ENGINE FIRE LEFT; ENGINE FIRE RIGHT or APU FIRE is transmitted to the headset.

54. **FIRE EXTINGUISHING SYSTEM.** The fire extinguishing system uses a single fire extinguisher tank with three distribution lines, one for each APU or engine/AMAD bay. The system is a one-shot one-bay system. During ground operation of the APU, if the fire detection system detects a fire in the APU bay, the APU is automatically shut down and 10 seconds later the fire extinguisher agent is discharged into the APU bay. The automatic system does not operate in flight. Manual operation of the APU fire extinguishing system is accomplished by pressing the APU FIRE warning light and then pressing the READY DISCHG light. Operation of the engine/AMAD fire extinguishing system is accomplished by lifting the guard over the left or right FIRE warning light and pressing the light. This shuts down the corresponding engine and arms the fire extinguisher. Pressing the READY DISCHG light causes the fire extinguishing agent to discharge into the selected engine/AMAD bay. On F/A-18B AND F/A-18D aircraft, the fire extinguishing system can only be activated from the cockpit.

55. POWER PLANT AND RELATED SYSTEMS.

56. **ENGINE.** ON 161353 THRU 164692, the aircraft is powered by two F404-GE-400 engines. ON 164693 AND UP, the aircraft is powered by two F404-GE-402 engines. Each engine is a low bypass axial-flow turbo fan with afterburner. The three

stage fan (low pressure compressor) is driven by a single stage turbine. Approximately one-fourth of the fan discharge air is bypassed to the afterburner for combustion or cooling. The seven stage high pressure compressor is also driven by a single stage turbine. The first and second stage compressor stators are variable. Fourth stage compressor air is used by the engine anti-ice system. A set of variable inlet guide vanes are mounted in front of both the fan and compressor to direct the inlet air at the best angle for the existing engine operation. Atomized fuel and compressor discharge air are mixed and ignited in the combustion chamber. These ignited gases then pass through the compressor and fan drive turbines and out the engine exhaust. Afterburner operation uses added atomized fuel mixed with the combustion discharge gases and the bypass fan discharge air to produce additional thrust. The electrical control assembly, variable exhaust nozzles, main fuel control, and afterburner fuel control provide coordinated operation of the engine through every part of its envelope. The engine accessory gearbox, driven by the compressor rotor, powers the lubrication and scavenge oil pumps, variable exhaust nozzle power unit, generator, main fuel pump and control, afterburner fuel pump and AMAD through the PTS.

57. **Ignition System.** Each ignition system is made up of an independent engine mounted alternator, electrical control unit, ignition exciter, a main igniter, and an afterburner igniter. During engine start, moving the throttle from OFF to IDLE turns on ignition. Ignition remains on until the engine reaches 45 % rpm or the throttle is moved to OFF. Engine ignition also comes on when afterburner is selected. Afterburner ignition comes on when the throttle is moved into afterburner and remains on until afterburner lightoff is sensed. If more than 50 % afterburner is selected, ignition is automatically turned on if an afterburner blowout occurs.

58. **Lubrication System.** The lubrication system is self-contained and is made up of a pressure-filled supply tank, combination lube and scavenge pump, oil filter, oil cooler, gearbox, engine sumps, scavenge screens, magnetic chip detectors, pressure transducer, and interconnecting piping. Oil gravity-flows from the tank to the pump. A pressure transducer, in the pump output line, transmits an electrical signal to the cockpit pressure indicator.

59. **Main Fuel System.** Throttle movement is mechanically transmitted to a power lever control (PLC). The PLC acts as a power booster and positions the main fuel control. If the automatic throttle control (ATC) is engaged, it schedules the power lever control for existing engine power requirements and the throttle follows this movement. Below MIL power, throttle movement and compressor inlet temperature (through the main fuel control) control the compressor speed. At MIL and above, fan speed is controlled by the electrical control assembly (ECA) as a function of inlet temperature. At and above military power, the ECA senses engine and aircraft parameters, computes engine schedules, and maintains engine limits.

60. **Afterburner Fuel System.** When the throttle is moved into afterburner, the main fuel control sends a permission signal to the afterburner control and ECA. The ECA then turns on ignition and positions the afterburner metering valve to a minimum (pilot) flow and holds this until light off is sensed. After light off, the ECA turns off ignition and schedules fuel flow as a function of throttle position and engine inlet temperature. Retarding the throttle to MIL or below terminates afterburner.

61. **Variable Exhaust Nozzle System.** The Variable exhaust nozzle (VEN) system automatically controls the throat area (A_8) for the exhaust gases from the turbine and afterburner. The VEN is scheduled in response to throttle movement. However, the schedule is adjusted by the ECA using engine inlet temperature and atmospheric conditions to provide required thrust while maintaining fan speed and exhaust gas temperature (EGT) limits.

62. **Variable Geometry System.** The variable geometry system automatically positions the fan and compressor inlet guide vanes and compressor variable stators to the most efficient position for existing engine operation while maintaining stall margin.

63. **N_2 Lockup System.** The N_2 lockup system maintains airflow through the engine by preventing engine rpm from dropping below military when the throttle is moved below MIL and mach number is greater than 1.23.

64. **Anti-Icing System.** The anti-icing system uses fourth stage high pressure compressor bleed air to

prevent buildup of ice on the front frame struts, inlet guide vanes, and inlet centerbody.

65. **ENGINE INSTRUMENT SYSTEM.** On F/A-18A AND F/A-18B aircraft, the engine instrument system is made up of a crew station engine monitor indicator (EMI), a left digital display indicator (DDI), and a nose wheelwell digital display indicator (NWWDDI). The EMI displays compressor speed in percent rpm, exhaust gas temperature in degrees centigrade, engine combustor fuel flow in pounds per hour, variable exhaust nozzle position in percent, and oil pressure in psid. On F/A-18C AND F/A-18D aircraft, the engine instrument system is made up of a crew station integrated fuel - engine indicator (IFEI), a left DDI, and a NWWDDI. The IFEI displays compressor speed in percent rpm, exhaust gas temperature in degrees centigrade, engine combustor fuel flow in pounds per hour, variable exhaust nozzle position in percent, oil pressure in psid, fuel quantities of each tank, total fuel quantity, fluid check, Bingo fuel quantity, maintenance codes, and a real time clock. The left DDI may be used to display an inflight engine condition monitoring system (IECMS) display. IECMS, when selected, displays engine inlet temperature in degrees centigrade, fan speed in percent rpm, compressor speed in percent rpm, exhaust gas temperature in degrees centigrade, engine combustor fuel flow in pounds per hour, variable exhaust nozzle position in percent, oil pressure in psid, engine thrust in percent, vibration in inches per second, fuel inlet temperature in degrees centigrade, engine pressure ratio in units, compressor discharge pressure in psia, and turbine discharge pressure in psia. The DDI also automatically displays engine cautions and advisories. When an engine out of limits condition and a caution is set on the DDI, a voice alert of ENGINE LEFT or ENGINE RIGHT is transmitted to the headset. The NWWDDI also records various engine conditions or faults. On F/A-18B aircraft, the rear EMI and left DDI repeat cockpit displays. On F/A-18D aircraft, the rear IFEI and left DDI repeat cockpit displays.

66. **THROTTLE SYSTEM.** Throttle movement is transmitted by mechanical linkage and airframe mounted throttle boost actuators to the PLC. The throttle boost actuators reduce the force required to move the throttles. The PLC interfaces with the flight control computer to provide ATC for approach power compensation (APC) or velocity control system (VCS) operation, when selected. Idle stops prevent the throttles from being inadvertently retarded to OFF. To retard the throttle to OFF, the fingerlifts must be raised to pass over the IDLE stop(s). A retractable flight IDLE stop is provided for inflight IDLE. With weight on the gear, the stop is retracted and the ground IDLE stop is used. With weight off the gear, the stop extends and provides a higher IDLE rpm. A retractable afterburner stop provides an afterburner lockout to prevent afterburner selection during arrested landings. The stop extends with weight on the gear, the launch bar extended and/or the arresting hook down. The stop retracts when both the launch bar is retracted and the arresting hook is up. The inflight IDLE and the afterburner lockout can be bypassed by lifting the fingerlifts. The afterburner lockout stops can also be overridden by applying force to the throttles. Switches on the throttle quadrant are actuated at or above the MIL position to supply signals to the catapult and bleed air systems. On F/A-18B AND F/A-18D aircraft, the rear throttles are mechanically connected to the forward throttle linkage to provide limited engine control. The rear throttles do not have fingerlifts; therefore, throttle movement requiring use of the fingerlifts cannot be performed from the rear cockpit.

67. **ENGINE MOUNT SYSTEM.** Each engine is supported by 3 mounts. The forward inboard and outboard mounts support the engine and are thrust mounts. The aft mount is only a support mount. Each mount has a fail safe device to support the engine should the mount fail.

68. **AIR INDUCTION SYSTEM.**

69. **Inlet Bleed Air System.** The inlet bleed air system provides the best inlet airflow to the face of the engine. This is accomplished by inlet bleed air doors (automatically controlled by the air data sensor) for inlet airflow control and by a bleed air channel for fuselage boundary layer airflow control.

70. **Inlet Ice Detector System.** The inlet ice detector system activates an INLET ICE display on the left DDI.

71. ENVIRONMENTAL CONTROL SYSTEMS.

72. The environmental control systems are a group of 13 systems that control the cockpit environment

and the environment of avionic equipment on the aircraft. Several of these systems are physically and electronically connected to provide the continuous airflow and temperature control required. The 13 systems which make up the environmental control systems are listed below:

a. Bleed air system

b. Bleed air leak detection system

c. Air cycle air conditioning system

d. Cabin cooling and defog system

e. Avionics cooling system

f. Cabin pressurization system

g. Anti-G system

h. Vent suit system

i. Windshield anti-ice and rain removal system

j. Radar liquid cooling system

k. Canopy seal system

l. Oxygen system

m. On-board oxygen generating system (OBOGS)

n. Waveguide pressurization system

73. **BLEED AIR SYSTEM.** Bleed air is extracted by ducting from the last compressor stage of the right and left engines. The BLEED AIR control switch allows the pilot to select either or both engine sources. Bleed air is pressure regulated and routed through control valves to the air cycle air conditioning system.

74. **BLEED AIR LEAK DETECTION SYSTEM.** The bleed air leak detection system is made up of a control unit and 10 sensing elements. Each sensing element is made up of a heat sensing wire and a responder. The responder houses a pressure activated normally open alarm switch, and a normally closed integrity switch. If a bleed air leak occurs, the heat sensing wire closes the pressure actuated alarm switch. Actuation of the alarm switch(es) causes the bleed air system to shutoff.

75. **AIR CYCLE AIR CONDITIONING SYSTEM.** The air cycle air conditioning system cools and conditions hot bleed air from the bleed air system for use in various aircraft systems. Bleed air is transported through the primary heat exchanger where ram air absorbs heat from the bleed air. The heated ram air is exhausted overboard. The primary heat exchanger is chambered and delivers cooled bleed air to three major areas. The coolest air, tapped from the front of the primary heat exchanger, is distributed without further cooling, to the fuel pressurization system, canopy seal system, anti-g system, throttle boost and to operate the cabin ram air door. Air tapped from the center of the primary heat exchanger is supplied as a cooling air input to the windshield anti-ice and rain removal system. The major portion of airflow is tapped from the rear of the primary heat exchanger and is further conditioned for use in cabin and avionics cooling. A turbine/compressor assembly, water extractor and a series of heat exchangers condition this airflow for delivery to the cabin and to avionics.

76. **CABIN COOLING AND DEFOG SYSTEM.** The cabin cooling and defog system controls and transports conditioned air to the cabin. Conditioned air from the air cycle air conditioning system is transported to the cabin flow valve where cabin inlet airflow is controlled by the ACS temperature/flow controller. Air leaving the cabin flow valve is mixed with hot air as required by the temperature setting on the suit/cabin temperature control. The conditioned air is divided between cabin air and windshield defog air by a control handle. A cabin ram air scoop, when opened, provides outside ram air to the cabin. The scoop is opened automatically by loss of airflow from the air cycle air conditioning system, or it can be opened by controls in the cockpit.

77. **AVIONICS COOLING SYSTEM.** The avionics cooling system controls and transports conditioned air to the various avionics packages and equipment bays. An avionics ram air valve automatically provides ram air for the avionics cooling if cooling airflow drops below a preset limit. FCS emergency ram air cooling for essential avionics equipment is provided by an FCS emergency ram air scoop. The scoop is controlled by a switch in the cockpit. Ground cooling of the avionics equipment bays is provided by an avionics ground cooling fan. Cockpit avionics equipment is cooled by a fan in each left and right console. On 163092 AND UP, a cabin exit air valve, controller exit air regulator and cabin exit

air solenoid have been added to provide additional avionics cooling capability.

78. **CABIN PRESSURIZATION SYSTEM.** The cabin is pressurized by conditioned air supplied from the cabin cooling and defog system. Pressurization is done by a pressure regulator controlling the rate of outflow air from the sealed crew station. The outflow air is routed into the equipment bays, where it augments avionics cooling before venting overboard. Cockpit altitude is maintained the same as aircraft altitude below 8000 feet. A cabin air pressure safety valve automatically relieves excessive positive or negative cabin pressure, and aids the cabin air pressure regulator in dumping cabin air in emergencies. The valve is controlled by a switch in the cockpit.

79. **ANTI-G SYSTEM.** The anti-g system automatically regulates air pressure to the pilot's anti-g suit to increase pilot tolerance to high acceleration levels. Air pressure to the anti-g system goes directly from the primary heat exchanger to the anti-g valve(s).

80. **VENT SUIT SYSTEM.** The vent suit system supplies temperature controlled and pressure regulated air to the pilot's vent suit. Air from the air cycle air conditioning system is supplied to the vent suit system, after being mixed with warm air from the windshield anti-ice and rain removal system. Temperature is controlled by the SUIT/CABIN TEMP control in the cockpit. Flow to the vent suit is pressure regulated and can be manually adjusted in the cockpit.

81. **WINDSHIELD ANTI-ICE AND RAIN REMOVAL SYSTEM.** The windshield anti-ice and rain removal system supplies controlled temperature air, from the air cycle air conditioning system to the external surface of the windshield. There are three modes of operation controlled by the WINDSHIELD ANTI-ICE/RAIN switch on the ECS panel in the cockpit: OFF; RAIN, which directs low volume, low pressure air across the windshield; and ANTI-ICE which directs high volume, high pressure air across the windshield.

82. **CANOPY SEAL SYSTEM.** The canopy seal system provides a pressurized seal between the windshield arch, canopy sill, and canopy. The canopy seal is an inflatable seal mounted in a retainer on the canopy frame. Pneumatic pressure for the canopy seal system is supplied from the air cycle air conditioning system. When the canopy is down and locked the canopy seal pressure regulator closes a vent, allowing the canopy seal to inflate. When the canopy is unlocked or up, the canopy seal pressure regulator vents downstream pressure allowing the canopy seal to deflate. The canopy seal is pressurized to approximately 20 psi.

83. **WAVEGUIDE PRESSURIZATION SYSTEM.** The waveguide pressurization system provides regulated, filtered, dry air to the radar and electronic countermeasures waveguide cavities. The air is supplied from the windshield anti-ice and rain removal system.

84. **RADAR LIQUID COOLING SYSTEM.** The radar liquid cooling system circulates liquid coolant to remove heat from the radar transmitter high voltage modules. Coolant, heated by the transmitter, is routed through a closed loop system to a heat exchanger. One of three sources of air is forced across the heat exchanger to provide coolant temperature control. During normal flight operation, ram air is forced across the heat exchanger, through an electrically powered ram air scoop. At high ram air temperature conditions (hot day - low altitude or high speed - high altitude) the ram air scoop is closed by a signal from the air data computer and conditioned air from the air cycle air conditioning system is delivered to the heat exchanger. For ground operation, with aircraft weight on wheels, a cooling fan in the left LEX supplies cooling air to the heat exchanger.

85. **OXYGEN SYSTEM - 161353 THRU 164068.** Breathing oxygen is supplied by a 10 liter liquid oxygen (LOX) system. Oxygen is routed through a hose from the left console to the ejection seat, through the survival kit, to the pilot's oxygen regulator connector. As the liquid oxygen travels through a supply line and LOX heat exchanger, vaporization occurs which provides gaseous oxygen for breathing. Flow of gaseous oxygen is started/stopped by use of the OXYGEN ON/OFF valve on the left console.

86. **ON-BOARD OXYGEN GENERATING SYSTEM (OBOGS) - 164196 AND UP.** The on-board oxygen generating system (OBOGS) removes nitrogen and other contaminants from engine bleed air. The resultant product gas is the oxygen rich breathing mixture for pilots use.

87. **ELECTRICAL SYSTEM.**

88. The electrical system is made up of an AC power system, a DC power system and a power distribution system.

89. **AC POWER SYSTEM - 161353 THRU 161987 BEFORE F/A-18 AFC 48.** Primary AC electrical power is provided by two 30/40KVA, 115/200vac, 3 phase, four-wire wye connected, 400 Hz variable speed constant frequency (VSCF) generating systems. Either generating system can supply all AC aircraft loads. Each generating system is normally connected to an independent main 115/200vac bus (split-bus distribution); however, both main AC buses are connected to the operating system during single system operation. Current limiters in the transfer feeder lines prevent a bus failure from disabling both systems. The power output from each generating system to its related bus is controlled by logic in the generator which operates a power contactor. The generator logic and power contactors provide transfer of loads from an inoperative generator to the remaining generator. The control and bus transfer operation is fully automatic after loss of one generator. Circuits in the generator protect the AC power system and aircraft equipment from damage as a result of: overvoltage, undervoltage, overfrequency, underfrequency, feeder faults, excessive waveform distortion and excessive DC voltage content. A 26vac transformer assembly provides 26vac to selected aircraft components. Each generator has an OFF-NORM GEN control switch. Each system is reset by cycling the respective GEN switch. If either generator shuts down, the applicable R GEN or L GEN caution light is displayed on the caution light indicator panel. A caution message is also displayed on the left Digital Display Indicator in the cockpit and on the left Digital Display Indicator in the rear cockpit.

90. **AC POWER SYSTEM - 162394 AND UP; ALSO 161353 THRU 161987 AFTER F/A-18 AFC 48.** Primary AC electrical power is provided by two 30/40KVA, 115/200vac, 3 phase, four-wire wye connected, 400 Hz variable speed constant frequency (VSCF) generating systems. Either generating system can supply all AC aircraft loads. Each generating system is normally connected to an independent main 115/200vac bus (split-bus distribution); however, both main AC buses are connected to the operating system during single system operation. If a dual generator outage occurs as a result of a bus failure, both generators automatically reset. The generator which supplies the faulted bus stays off line and the good generator supplies power to its respective bus only (automatic AC bus isolation). The power output from each generating system to its related bus is controlled by logic in the generator which operates a power contactor. The generator logic and power contactors provide transfer of loads from an inoperative generator to the remaining generator. The control and bus transfer operation is fully automatic after loss of one generator. If both generators shut down, the generators are automatically reset, and when a generator comes back on line, the GEN TIE caution light is displayed on the caution light indicator panel. Circuits in the generator protect the AC power system and aircraft equipment from damage as a result of: overvoltage, undervoltage, overfrequency, underfrequency, feeder faults, excessive waveform distortion and excessive DC voltage content. A 26vac transformer assembly provides 26vac to selected aircraft components. Each generator has an OFF-NORM GEN control switch. Each system is reset by cycling the respective GEN switch. If either generator shuts down, the applicable R GEN or L GEN caution light is displayed on the caution light indicator panel. A caution message is also displayed on the left Digital Display Indicator in the cockpit and on the left Digital Display Indicator in the rear cockpit.

91. **External Electrical Power.** When AC power is required on the ground without using onboard generation provisions (APU/AMAD/GENERATOR), external electrical AC power can be used from either a power cart or hangar/deck power by way of the external power receptacle. The EXT PWR switch provides ON-OFF-RESET control and resets the external power monitor if a temporary failure occurs.

92. **DC POWER SYSTEM.** The DC power system is made up of primary and secondary DC power.

93. **Primary DC Power.** Primary DC electrical power is provided through conversion of 3 phase, 115vac, 400 Hz using two 150A, 28vdc power supplies. Either power supply can supply all aircraft DC loads if a power supply fails. The right DC bus is connected to the left DC bus by two DC bus tie current limiters and a power zener. The current limiters prevent a malfunction on one bus from disabling the other bus. The power zener suppresses

voltage transients which could occur during an AC to DC bus fault.

94. **Secondary DC Power - 161353 THRU 161528 BEFORE F/A-18 AFC 49.** If both generators or both primary DC power supplies are inoperative, the secondary DC power source supplies power to selected DC loads. The secondary DC power source is made up of two identical nickel cadmium, 5 ampere hours battery and charger units: utility and emergency. When external power is not applied, the battery and charger units are used to start the aircraft and power essential DC loads. Secondary DC power is controlled by the BATT (ON-OFF-ORIDE) switch. The BATT switch does not control the battery power supplied to the maintenance bus. During flight, the BATT switch is ON. If a dual generator or power supply failure occurs or if voltage on the left 28vdc bus drops below 20.5vdc, the utility battery supplies power to the essential, maintenance, and start 24/28vdc buses. The ORIDE position on the BATT switch is used when the left 28vdc bus is less than 20.5vdc and the automatic sensing/switching circuits fail to connect the utility battery and charger unit to the essential bus. The emergency battery and charger unit then powers the essential bus.

95. **Secondary DC Power - 161702 THRU 163118 BEFORE F/A-18 AFC 90; ALSO 161353 THRU 161528 AFTER F/A-18 AFC 49 AND BEFORE F/A-18 AFC 90.** If both generators or both power supplies are inoperative, the secondary DC power source supplies power to selected DC loads. The secondary DC power source is made up of two identical sealed lead acid, 7.5 ampere hour batteries: utility and emergency. When external power is not applied, the batteries are used to start the aircraft and power essential DC loads. Secondary DC power is controlled by the BATT (ON-OFF-ORIDE) switch. The BATT switch does not control the battery power supplied to the utility battery/maintenance bus and emergency battery bus. During flight, the BATT switch is ON. If a dual generator or dual power supply failure occurs, the utility battery supplies power to the essential, utility battery/maintenance, and start 24/28vdc buses. The ORIDE position on the BATT switch is used when the automatic sensing/switching circuits fail to connect the utility battery to the essential bus. The emergency battery then powers the essential bus.

96. **Secondary DC Power - 163119 AND UP; ALSO 161353 THRU 163118 AFTER F/A-18 AFC 90.** If both generators or both power supplies are inoperative, the secondary DC power source supplies power to selected DC loads. The secondary DC power source is made up of two identical sealed lead acid, 7.5 ampere hour batteries: utility and emergency. When external power is not applied, the batteries are used to start the aircraft and power essential DC loads. Secondary DC power is controlled by the BATT (ON-OFF-ORIDE) switch. The BATT switch does not control the battery power supplied to the utility battery/maintenance bus and emergency battery bus. During flight, the BATT switch is ON. If a dual generator or dual power supply failure occurs, the utility battery supplies power to the essential, utility battery/maintenance, and start 24/28vdc buses. The ORIDE position on the BATT switch is used when the automatic sensing/switching circuits fail to connect the utility battery to the essential bus. The emergency battery then powers the essential bus. If the BATT (ON-OFF-ORIDE) switch is left in ON position while aircraft is on the ground, the battery relay control unit automatically disconnects utility battery from ESS 24/28vdc bus 5 ±0.5 minutes after internal or external power is removed.

97. **E/U BATT Voltmeter - 161702 AND UP; ALSO 161353 THRU 161528 AFTER F/A-18 AFC 49.** The E/U BATT voltmeter provides a visual readout of the emergency and utility batteries when the AC buses are not powered. When the AC buses are powered the voltmeter indicates the battery charger converter voltage. Voltage is indicated in 1 volt increments from 16 to 30 volts.

98. **Caution Lights - 161353 THRU 161528 BEFORE F/A-18 AFC 49.** Three caution lights, the U BATT, E BATT, and BATT SW are associated with operation of the batteries. All three lights are displayed on both the caution light indicator panel, and the left DDI as caution messages. The MASTER CAUTION comes on with these lights. The U BATT and E BATT lights come on to indicate a low state of charge of their respective batteries. The utility battery low level indication is operative when the BATT switch is ON. The emergency battery indication is operative when the BATT switch is in ON or ORIDE. The BATT SW light comes on to alert the pilot to inspect the position of the battery switch. The BATT SW light coming on in flight, indicates the BATT switch is in OFF or ORIDE position. The light coming on, on

the ground without AC electrical power on the aircraft, indicates that batteries are being depleted (BATT switch is in ON or ORIDE).

99. **Caution Light - 161702 AND UP; ALSO 161353 THRU 161528 AFTER F/A-18 AFC 49.** BATT SW caution light is displayed on the caution light indicator panel, and caution message is displayed on the left DDI. The MASTER CAUTION comes on with the BATT SW light. The BATT SW light comes on to alert the pilot to inspect the position of the BATT switch. The light coming on in flight, indicates the BATT SW is in OFF or ORIDE position. The BATT SW light coming on, on the ground without AC electrical power on the aircraft, indicates that batteries are being depleted (BATT switch in ON or ORIDE).

100. **POWER DISTRIBUTION SYSTEM.**

101. **Ground Power Switching.** Ground power is supplied either from an external power source or produced internally by the APU driving an airframe mounted accessory drive (AMAD) with the engine decoupled (auxiliary power). The GND PWR switches minimize operating time on selected equipment when the aircraft is supplied with ground power. The switches are located on the GND PWR control panel assembly in the cockpit. Each GND PWR switch controls input power to the equipment. When the GND PWR switches are in AUTO, all the controlled equipment is automatically turned off. Setting any one of the GND PWR switches to ON, causes the equipment related with that position to energize. Supplying the aircraft buses with engine driven internal power causes the GND PWR switches to automatically return to AUTO.

102. LIGHTING SYSTEM.

103. The lighting system is made up of the exterior lighting system, the interior lighting system, and the warning/caution/advisory lighting system.

104. **EXTERIOR LIGHTING SYSTEM.** The exterior lighting system is made up of: exterior lights switch, position lights, formation lights, anti-collision (strobe) lights, landing/taxi light, and the EXT LT control panel assembly. The master control for all the exterior lights except the landing/taxi light is located on the outboard left throttle grip. The EXT LT control panel assembly on the left console contains the strobe lights switch, and the POSITION and FORMATION lights dimmer controls. The landing/taxi light is controlled by the TAXI LIGHT switch on the LH vertical console control panel assembly. The light comes on when the LDG GEAR control is down and the TAXI LIGHT switch is ON.

105. **INTERIOR LIGHTING SYSTEM.** The cockpit interior lighting system provides primary and secondary lighting for the instruments, instrument panels and consoles. Displays and indicators come on to show information in both a daylight and night environment. Primary lighting is made up of integrally lighted control panels, instrument lights and information panels. The consoles light dimmer control and INST PNL dimmer control on the INTR LT control box panel assembly provides off/on/dimming control. Secondary lighting is made up of emergency flight instrument lights, engine instrument lights, utility lights, floodlights, and chart lights. The emergency instrument light is a stationary, non-dimmable, low intensity white floodlight which provides automatic emergency lighting of the standby flight instruments if a dual generator failure occurs. The engine instrument light is a stationary non-dimmable low intensity floodlight, which provides lighting for the cockpit crew station engine monitor indicator when the APU control switch is in the ON position. The utility light is a portable hand held floodlight. It has a self-contained brightness control, momentary on switch, and an integral white to red filter. The floodlights have two or three operating modes to control crew station lighting, DAY, NITE or NORM and NVG. In the DAY, NITE or NORM mode the floodlights are high intensity white lights used for emergency instrument lighting. In the NVG mode the floodlights are low intensity green lights that provide instrument and console lights. In the DAY, NITE or NORM modes these lights are controlled by the FLOOD light dimmer control on the INTR LT control panel assembly, and in the NVG mode they are controlled by the CONSOLE light dimmer control. The chart light is a dimmable white floodlight installed on the canopy arch and is controlled by the CHART light dimmer control. The rear cockpit contains the same lights as the cockpit interior lighting system except for the items below: emergency instrument light, engine instrument light, and chart light.

106. **COCKPIT WARNING/CAUTION/ADVISORY LIGHTING SYSTEM.** The cockpit warning/caution/advisory lighting system is made up of visual indications of normal aircraft operation

and malfunctions of systems affecting flight safety. The lights are on various system instruments and control panels in the cockpit. Red warning lights indicate system malfunctions requiring immediate corrective action. Corrective action deenergizes all warning indications. Yellow caution lights indicate malfunction of major subsystems requiring attention but not immediate corrective action. Green or white advisory lights indicate safe or normal conditions and supply information for routine functions. The LT TEST switch on the INTR LT control panel assembly tests all lights in the warning/caution/advisory system except those displayed on the left DDI. The WARN/CAUTION dimmer control on the INTR LT control panel assembly switches the warning/caution/advisory lights from bright intensity to the low intensity range, and then vary the brightness on most lights within the low intensity range. The rear cockpit warning/caution/advisory lights contains the same controls and operates the same as the cockpit system.

107. HYDRAULIC SYSTEM.

108. The hydraulic system is made up of a hydraulic system 1 (HS1) and hydraulic system 2 (HS2). Each system has a pump, reservoir, circuit A and B, and filters. The pumps are mechanically driven by the airframe mounted accessory drive (AMAD) and regulate output pressure at approximately 3000 psi. Both hydraulic systems provide pressure to the primary flight controls either as a primary or backup source. The HS2 system also supplies hydraulic pressure to all other non-flight control systems. The output pressure from each reservoir is divided into circuit A and circuit B. Each circuit has a shutoff to protect the other circuit from depletion if a leak occurs. To minimize HS2 pressure loss, HS2 circuit A pressure is removed from the nose landing gear, nose wheel steering, launch bar, and brakes when the landing gear is up. HS2 circuit B pressure is removed from the APU accumulator, emergency landing gear, emergency nose wheel steering, emergency inflight refueling probe, and hydraulic start system when weight is off gear. If pressure in the emergency brake accumulator falls below the HS2 circuit A pressure, then HS2 circuit A will trickle charge the accumulator through a restrictor and check valve. To protect the flight control system, 2 priority valves in HS2 circuit A will shut off pressure to all non-flight control subsystems if a pressure drop occurs upstream of the valves.

109. FUEL SYSTEM.

110. **FUEL STORAGE SYSTEM.** Fuel is carried internally by four interconnected fuselage tanks and two (wet) wing tanks. External fuel is carried in three 330 gallon tanks, on the centerline and inboard wing stations. Three vent tanks, one in each vertical stabilizer and one behind fuel tank 4, are used to collect fuel from thermal expansion or fuel spillage. All fuselage tanks are bladder type tanks that are held in place by nylon lacing cords, brackets and fittings. Tanks 2 and 3 are fuselage feed tanks that are divided internally by a horizontal inverted flight baffle. The inverted flight baffle provides fuel during negative G or inverted flight. The lower areas of tanks 2 and 3 are self-sealing. In case the tanks are damaged, the natural gum rubber activates and forms a temporary seal. The wing tanks are integral parts of the wing structure. They are sealed by channel sealant which is injected from outside the wing. Foam blocks are used in every part of the wing tank, preventing an explosive atmosphere. The vertical stabilizer vent tanks are also integral parts of structure that are channel sealed.

111. **REFUEL/DEFUEL SYSTEM.** Refueling and defueling can be done without electrical power. The refuel system operates with a maximum supply pressure of 55 psi. The aircraft fuel tanks are refueled through a single point pressure receptacle in door 8 or the inflight refueling (IFR) probe. Except for the IFR probe and the cockpit PROBE control switch, the ground and inflight refueling systems are the same. A precheck of the fuel level control shutoff valves is done before each refueling of the aircraft. On F/A-18C AND F/A-18D, if the correct results of the refueling precheck are not obtained and electrical power is applied to aircraft, then a fault analysis refueling test may be done to find the malfunctioning component. Also, if electrical power is applied, the VENT TANK WET light will be displayed anytime fuel is overfilling the fuselage vent tank while refueling. On F/A-18A AND F/A-18B, individual tank precheck valves are used to test the shutoff valves in each tank during testing and troubleshooting. The aircraft is defueled by applying suction pressure at the refuel/defuel receptacle. The external tanks are normally defueled by using an external air source to transfer fuel into the internal tanks. On F/A-18C AND F/A-18D, the number 4 fuel tank pilot line shutoff valve solenoid, operated by the Signal Data

Computer CP-1726/ASQ-194, will prevent an aft CG condition while refueling with electrical power.

112. **INFLIGHT REFUELING (IFR) SYSTEM.** The IFR system allows transfer of fuel from a tanker aircraft through the probe to the fuel tanks. The probe is electrically controlled and hydraulically operated. It is mounted on the right forward part of the fuselage. Inflight refueling is the same as ground refueling. If the normal hydraulic system fails, APU accumulator pressure is used to emergency extend the probe. A floodlight illuminates the probe for night refueling.

113. **EXTERNAL FUEL SYSTEM.** The external fuel system is made up of three aluminum external fuel tanks. Engine bleed air is used to pressurize the tanks and to transfer fuel to any internal tank that will accept it. The tanks are not normally pressurized when weight is on the wheels, the arresting hook is down, or the inflight refueling probe is extended. However, an override function provides pressurization with aircraft weight on wheels and/or the IFR probe extended. If external transfer is not selected, automatic transfer occurs when the internal fuel reaches fuel low level warning. The external tanks may be jettisoned selectively or all at one time.

114. **INTERNAL FUEL TRANSFER SYSTEM.** The internal fuel transfer system keeps the feed tanks (tanks 2 and 3) full and controls the sequence of tank-to-tank transfer. Two AMAD driven motive flow/boost pumps provide a closed loop motive flow pressure system that transfers fuel from the wing tanks, tank 1, and tank 4 to the engine feed tanks. On F/A-18A and F/A18B, wing tank fuel is transferred to tanks 1 and 4 and tank 1 and 4 fuel is transferred to the engine feed tanks. On F/A-18C and F/A-18D, wing tanks, tank 1, and tank 4 fuel is transferred to the engine feed tanks. An inhibit function, if selected, prevents wing tank fuel from transferring. If motive flow pressure fails, wing tank, tank 1, and tank 4 fuel gravity transfers (at a reduced rate) to the engine feed tanks. A fuel scavenge system uses motive flow pressure to continuously scavenge fuel from the vent tanks to tanks 2 and 3.

115. **CG CONTROL SYSTEM.** On 161520 THRU 163175, aircraft center of gravity is maintained by the cg control system. The fuel quantity gaging intermediate device compares fuel quantities and signals the transfer control valve to stop or start transfer from tank 1. On 161924 THRU 163175, during negative G operation, the air data computer signals the transfer control valves in tank 1 and tank 4 to stop transfer. On F/A-18C AND F/A-18D, the Signal Data Computer CP-1726/ASQ-194 monitors the amount of fuel in tank 1 and 4, therefore, if the fuel in tank 4 becomes excessive, during either transferring or refueling the computer will close the valves in the affected tank to prevent an aft CG problem. The fuel transfer turbine pumps in tank 1 and 4 will also be shutoff during negative G or inverted flight operation.

116. **ENGINE FUEL SUPPLY SYSTEM.** Each engine is supplied motive flow/boost pressure fuel by a separate engine feed system. Tank 2 feeds the left engine and tank 3 feeds the right engine. Each feed tank has an inverted flight compartment for 10 seconds of fuel supply, at an engine fuel flow rate of 40,000 pph, during negative G and inverted flight. Each engine feed line has a fuel shutoff valve that is electrically controlled by its corresponding engine FIRE warning light. The engine feed lines are interconnected by a crossfeed line and valve that allow operation of both engines from either feed tank. A normally closed crossfeed valve downstream of the shutoff valves, automatically opens if boost pressure is low in one feed system. However, if a fuel shutoff valve is selected closed by the engine FIRE warning light, the crossfeed valve remains closed and only single-engine operation is available. The fuel supply for the APU system is drawn from the left engine feed line upstream of the fuel shutoff valve.

117. **FUEL DUMP SYSTEM.** All the fuel aboard the aircraft, except 800 ±100 lbs. of fuel in each feed tank can be dumped in flight to reduce weight. The pilot can decide the amount of fuel to dump overboard by setting the BINGO on the fuel QTY indicator. On F/A-18A AND F/A-18B, pressure for fuel dump comes from the fuselage transfer ejectors in fuel tanks 1 and 4. On F/A-18C AND F/A-18D, pressure for fuel dump comes from fuel tank fuel turbine pump in fuel tanks 1 and 4. Fuel discharges aft through outlets on the trailing edges of both vertical stabilizers. Flame arrestors at the dump outlets prevent flames from spreading upstream to the fuel tanks. Fuel will continue to dump from fuel tanks 1 and 4 until they are empty or the BINGO fuel setting is arrived at (if above feed tank level 800 ±100 lbs).

118. **HOT FUEL RECIRCULATION SYSTEM.** The hot fuel recirculation system cools the fuel which is used to dissipate heat from the AMAD and hydraulic system. Some motive flow/boost fuel is routed through the oil/fuel heat exchangers. Hot fuel from the oil/fuel heat exchangers enter the fuel/air heat exchanger where external ram air cools the fuel. On F/A-18A AND F/A-18B, fuel then travels to the diverter valve and wing tank where it dissipates heat and then transfers to tanks no. 1 and no. 4. If the internal wing tanks switch is in INHIBIT and engine feed tanks fuel is at FUEL LO level (800 ±100 lbs), the diverter valves divert the fuel into tanks 2 and 3. On F/A-18C AND F/A-18D, fuel then travels to the diverter valve which routes the fuel to either the wing tanks, the feed tanks or to tank no. 4 depending on engine fuel inlet temperature and fuel quantity of the aircraft.

119. **FUEL PRESSURIZATION AND VENT SYSTEM.** The fuel pressurization and vent system provides regulated engine bleed air pressure to all internal tanks. Pressurization prevents fuel boil-off at high altitude, provides positive pressure to tank bladders and to external tanks for fuel transfer. The system also provides pressure relief of the fuel tanks during climbs and vacuum relief of the fuel tanks during descents. The internal tanks air pressure regulator has a high and low stage, controlled by solenoids. With engine bleed air available, tanks can be pressurized when electrical power is on, the inflight refueling probe is retracted, weight is off the wheels, and the arresting hook is up. The external tank(s) may be pressurized with aircraft on the ground by setting the EXT TANKS switch(es) to OVERRIDE, provided the arresting hook is up. The internal tanks vent into the vent tank which in turn is vented through outlets in each vertical fin. Fuel in the vent tank is returned to tanks 2 and 3 by scavenge lines.

120. **FUEL QUANTITY GAGING SYSTEM - F/A-18A AND F/A-18B.** The fuel quantity gaging system provides readings, in pounds, of usable internal and total fuel. The system is made up of fuel quantity transmitters, fuel quantity indicator, (repeater indicator F/A-18B) and intermediate device. The fuel quantity indicator has a pointer and a counter. The pointer indicates useable internal fuel and the counter indicates total (internal and external) fuel. Two other counter positions, marked LEFT and RIGHT, and a selector switch, provide individual tank monitoring and a test of the indicator. The BIT system tests the fuel quantity indicator, intermediate device, and fuel low level warning system. BIT does not test the fuel quantity transmitters or wiring to the intermediate device. No calibration is required if any of the components are replaced, because the system is preset. A BINGO caution display on the left DDI and BINGO voice alert come on at a preset value controlled by an adjustable index (bug) on the face of the fuel quantity indicator.

121. **FUEL QUANTITY GAGING SYSTEM - F/A-18C AND F/A-18D.** The Integrated Fuel - Engine Indicator ID-2389/A (IFEI) is the primary fuel quantity display. Normally, total fuel and internal fuel amounts will be shown in pounds. The QTY pushbutton switch will change the amounts shown in pounds to:

Tank no. 2 and no. 3
Tank no. 1 and tank no. 4
Left wing tank and right wing tank
External left tank and external right tank
Centerline tank

The (IFEI) also displays the selected bingo fuel amount in pounds. Both the BINGO caution and voice alert are controlled by the (IFEI). The fuel quantity of each tank can be viewed simultaneously on the left Digital Display Indicator. The fuel quantity BIT is also done on the left Digital Display Indicator.

122. **FUEL QUANTITY LOW LEVEL WARNING SYSTEM.** The fuel quantity low level warning system is completely independent of the fuel quantity gaging system. When the fuel quantity in either engine feed tank drops to approximately 800 ±100 pounds, a FUEL LO light, a FUEL LO caution display, a FUEL LOW voice alert, and the MASTER CAUTION light come on. When the EXT TANKS switch(es) are set to STOP and the fuel low level warning is activated, external fuel will transfer provided the arresting hook is up. Fuel dump, if selected, will stop when fuel level depletes to low level warning.

123. INSTRUMENT SYSTEMS.

124. The instrument systems are made up of the pitot static system, with related instruments, and miscellaneous instruments.

125. **PITOT STATIC SYSTEM AND RELATED INSTRUMENTS.** The pitot static system measures pitot and static pressures surrounding the aircraft.

There are two pitot static tubes mounted under the nose on each side, forward of the nose wheelwell. Each tube contains one pitot source and two static sources. The pressures are directed to the air data computer (ADC) and the air data sensor (ADS), and to instruments in the aircraft to indicate airspeed, altitude and vertical speed. A STATIC SOURCE SELECT valve in the right rudder pedal well, allows selection of backup or normal static pressure to be applied to the indicated airspeed indicator, standby pressure altimeter, and vertical speed indicator in each cockpit. Electrically operated heaters are used to prevent ice buildup on the pitot static tubes and are controlled by an ANTI ICE PITOT switch on the ECS panel assembly. With the switch ON, the heaters will operate on the ground or in flight. With the switch in AUTO the heaters will operate only in flight.

126. **Indicated Airspeed Indicator (Cockpit And Rear Cockpit).** The indicated airspeed indicator displays airspeed as a function of pitot and static pressure. Airspeed is indicated in 10 knot increments from 50 to 200 knots and 50 knot increments from 200 to 850 knots.

127. **Standby Pressure Altimeter (Cockpit and Rear Cockpit).** The standby altimeter uses static pressure and provides the displays below: pointer display from 0 to 1000 feet in 50 foot increments, a drum display with two movable digits indicating in 1000 foot increments to 50,000 feet, and a four digit display indicating barometric pressure. A barometric adjustment knob adjusts the barometric scale setting for variations in sea level atmospheric pressure. Barometric altitude supplied by the standby pressure altimeter, is also displayed on the HUD through the ADC.

128. **Vertical Speed Indicator (Cockpit and Rear Cockpit).** The vertical speed indicator senses changes in static air pressure and displays them in the form of climb or dive rate from 0 to 6000 feet per minute. The upper half of the display indicates rate of climb in 100 foot increments from 0 to 1000 feet and 500 foot increments from 1000 to 6000 feet. The lower half of the display is identical to the upper half except dive rate is indicated.

129. **MISCELLANEOUS INSTRUMENTS.**

130. **Mechanical Aircraft Clock.** On 161353 THRU 163175, an aircraft clock is installed in both cockpits. On 163427 AND UP, an aircraft clock is installed in the front cockpit only. The clock is mechanical, with an 8-day movement displaying time of day and elapsed time in seconds, minutes, and hours. It has a 12-hour range with 1-second sensitivity. The lower left control winds the clock and allows time set. The upper right control starts and stops the elapsed time counter and resets the counter.

131. AIR DATA COMPUTER SYSTEM.

132. The components of the air data computer system are the air data computer, the left and right airstream direction sensing units, the AOA approach light assembly and flasher, and the total temperature probe.

133. **AIR DATA COMPUTER.** The air data computer (ADC) is a solid state digital computer which receives inputs from various aircraft sensors. Any errors in these inputs are corrected in the ADC. These corrected signals are used to compute accurate air data and magnetic heading. ADC outputs are used for primary flight data displays, navigation, weapons delivery, altitude reporting, environment control, and unsafe landing warning. Built-in test circuitry in the ADC monitors its own operation.

134. **LEFT AND RIGHT AIRSTREAM DIRECTION SENSING UNITS.** The left/right airstream direction sensing unit (ADSU) provides angle of attack (AOA) information to the ADC and electronic flight control system. The left and right ADSU measure the difference between the longitudinal axis of the aircraft and the local airstream surrounding the aircraft. The ADSU converts this information into electrical values. The ADC uses these values to compute AOA values. The electronic flight control system uses the AOA inputs for longitudinal, directional and sideslip control, stall warning, aileron limiting and flaps scheduling. The ADC receives AOA inputs from the left and right ADSU and averages these values to compute local AOA. Local AOA is provided to the AOA approach and indexer lights for display during landing.

135. **AOA APPROACH LIGHT ASSEMBLY AND FLASHER.** The AOA approach light assembly displays landing approach AOA to the landing signal officer. The AOA approach light assembly display is controlled by the ADC. Three approach lights are on the nose gear strut. With all landing gear down and locked, and weight off the gear, the lights come on as a function of angle of attack. A

green light indicates a high angle of attack, an amber light indicates optimum angle of attack and a red light indicates a low angle of attack. When operating, all three lights flash if the arresting hook is not down and the HOOK BYPASS switch, on the left vertical panel, is in CARRIER. If the HOOK BYPASS switch is in FIELD, the lights will not flash.

136. **ANGLE OF ATTACK INDEXER - 161353 THRU 161519.** The angle of attack indexer is on the left side of the HUD. It shows approach angle of attack (AOA) with lighted symbols. The indexer operates only with the landing gear down and weight off the gear. At less than 6.4° AOA (fast) the lower symbol, a red inverted V, lights. From 6.4° to 6.9° AOA (slightly fast), the red inverted V and the center symbol, an amber circle, light. From 6.9° to 8.1° AOA (optimum approach speed) only the amber circle lights. From 8.1° to 8.9° AOA (slightly slow) the amber circle and the upper symbol, a green V, light. Over 8.9° AOA (slow) only the green V lights. The lighted symbol(s) flash if the arresting hook is up and the HOOK BYPASS switch, on the left vertical panel, is in CARRIER. The symbols will not flash with the arresting hook up and the hook bypass switch in FIELD. The AOA indexer knob on the HUD, controls dimming of the symbols.

137. **ANGLE OF ATTACK INDEXER - 161520 AND UP.** The angle of attack indexer is on the left side of the HUD. It shows approach angle of attack (AOA) with lighted symbols. The indexer operates only with the landing gear down and weight off the gear. At less than 6.9° AOA (fast) the lower symbol, a red inverted V, lights. From 6.9° to 7.4° AOA (slightly fast), the red inverted V and the center symbol, an amber circle, light. From 7.4° to 8.8° AOA (optimum approach speed) only the amber circle lights. From 8.8° to 9.3° AOA (slightly slow) the amber circle and the upper symbol, a green V, light. Over 9.3° AOA (slow) only the green V lights. The lighted symbol(s) flash if the arresting hook is up and the HOOK BYPASS switch, on the left vertical panel, is in CARRIER. The symbols will not flash with the arresting hook up and the hook bypass switch in FIELD. The AOA indexer knob on the HUD, controls dimming of the symbols.

138. **TOTAL TEMPERATURE PROBE.** The total temperature probe (TTP) measures total temperature of the air outside the aircraft. The TTP converts the temperature to an electrical signal and sends it to the ADC. The TTP is protected from ice formation by a heater. Total temperature is compensated by mach to get ambient temperature. Total temperature is sent to total temperature altitude function computation circuit, analog output format circuit, and the digital computer. The total temperature altitude function computation circuit uses total temperature and pressure altitude to compute total temperature/altitude. Total temperature/altitude is sent to the digital computer and environmental control system (ECS). Total temperature is changed to analog format and used by the ECS. Ambient temperature is sent to the true airspeed computation circuit, air density ratio computation circuit and to the digital computer. Ambient temperature is used to compensate mach to get true airspeed. The ambient temperature is sent to the air density ratio computation circuit and is used to compensate static pressure to get an air density. Air density ratio and true airspeed are sent to the digital computer.

139. **ALTITUDE FUNCTIONS.** The ADC uses pitot and static pressures supplied by the aircraft pitot-static system. The ADC uses pressure data to compute pressure altitude, barometric altitude, and relative air density. The ACS temperature/flow controller uses pressure altitude analog data. A pressure altitude discrete signal regulates fuel tank air pressure.

140. **AIRSPEED FUNCTIONS.** The ADC uses pitot and static pressures data to compute total pressure, mach, indicated airspeed, and true airspeed. Local angle of attack and airframe configuration data are used as correction factors. Indicated airspeed discrete signals control primary and secondary ejector valve solenoids (ECS system).

141. INTEGRATED FLIGHT CONTROLS.

142. **ELECTRONIC FLIGHT CONTROL SYSTEM.** The electronic flight control system is made up of two flight control computers, control surface servoactuators, air data and inertial sensors, and control sensors. The system also includes a built-in test to provide failure warning and fault isolation. The flight control computers combine inputs with air data and inertial inputs and provide electrical signals to servoactuators. The servoactuators move control surfaces the direction and amount required to produce desired aircraft motion.

143. **Flight Control Computers.** The two flight control computers (FCCA and FCCB) are identical and interchangeable. Each computer has two independent channels. Loss of any one channel will not affect flight controls. The computers contain provisions for automatic selection of degraded modes after multiple failures in an axis (pitch, roll or yaw). The first degraded mode is digital direct electrical link (DEL). If the failures prevent digital DEL for either the ailerons or rudders, they will automatically shift to an analog DEL mode. If pitch or roll digital DEL fails, stabilator control for pitch and roll is automatically shifted to the backup mechanical flight control system (MECH).

144. **Pitch Axis.** Pitch axis control is provided by twin stabilators, powered by redundant hydraulic systems. The stabilators deflect symmetrically to produce pitch motion.

145. **Roll Axis.** Roll axis control is provided by ailerons, differential trailing edge flaps, differential stabilators, and on 161520 AND UP, differential leading edge flaps. All control surfaces are powered by redundant hydraulic systems.

146. **Yaw Axis.** Yaw axis control is provided by independent twin rudders, powered by redundant hydraulic systems. In flight the rudders are commanded symmetrically to produce yaw motion. To assist in nosewheel lift-off and improve stability during takeoff and landing the rudders deflect toward each other (toe-in) or away from each other (toe-out) as a function of AOA and FLAP switch position.

147. **NOSEWHEEL STEERING.** The nose wheel steering system provides directional aircraft control and shimmy damping during taxi, takeoff and landing. The directional control of the nose wheel steering system is provided by channels 2 and 4 of the Roll-Pitch-Yaw Computers (flight control computers). Channels 2 and 4 engage nose wheel steering when the nose landing gear and either main landing gear have weight on wheels. When the nose wheel steering system is engaged, the flight control computers provide a low or high gain driving range for directional aircraft control. When low gain driving range is activated, nose wheel travel is limited to approximately 16° either side of neutral. When high gain driving range is activated, nose wheel travel is limited to approximately 75° either side of neutral. When directional aircraft control is not engaged, the nose wheel steering system provides shimmy damping to nose wheels.

148. **BACKUP MECHANICAL FLIGHT CONTROL SYSTEM.** The backup mechanical flight control system (MECH) provides automatic connection of a direct mechanical link from the stick to the differential stabilator servoactuators. This provides limited pitch and roll control after a complete electrical failure or complete failure of both flight control computers.

149. **FLAPS - 161353 THRU 161519 BEFORE F/A-18 AFC 27.** The aircraft is equipped with leading and trailing edge flaps. With the FLAP switch in AUTO, the leading and trailing edge flaps are controlled by the flight control computers to provide the most efficient conformation for the flight conditions. The trailing edge flaps also operate differentially to assist in roll control. With the FLAP switch in HALF and below 215 knots the trailing edge flaps and ailerons go to 30° down. With the flaps switch in FULL and below 170 knots, the trailing edge flaps and ailerons go to 45° down. With the FLAP switch in HALF or FULL, the leading edge flaps are extended or retracted as a function of AOA. Control sensors transmit electrical signals, proportional to operator commands, applied at the aircraft controller grip assembly and rudder pedals, to the flight control computers.

150. **FLAPS - 161520 AND UP; ALSO 161353 THRU 161519 AFTER F/A-18 AFC 27.** The aircraft is equipped with leading edge and trailing edge flaps. With the FLAP switch in AUTO, the leading and trailing edge flaps are controlled by the flight control computers to provide the most efficient conformation for the flight conditions. The leading and trailing edge flaps also operate differentially to assist in roll control. With the FLAP switch in HALF or FULL and below 243 knots the trailing edge flaps are deflected in proportion to airspeed, to a maximum command of 30° (HALF) or 45° (FULL). With the FLAP switch in HALF or FULL, the leading edge flaps are extended or retracted as a function of AOA.

151. **SPEED BRAKE.** A speedbrake is mounted on top of the aircraft between the vertical stabilizers. On 161353 THRU 161519, it is controlled by a throttle mounted speed brake switch and a servo valve. On 161520 AND UP, it is controlled by a throttle mounted speed brake switch, flight control computers, and a servo valve. Hydraulic power is supplied by the HYD 2A system.

152. **WING FOLD.** Each outer wing panel is folded upward to a vertical position by a wing fold mechanical/electrical drive. A wing fold unlock flag in the upper surface wing fold area provides a visual indication of the wing lock pins in the unlocked position. The wing lock control and wing fold/spread control are combined in the wing fold handle on the lower right main instrument panel. A wing safety switch is located so that a safety pin can be manually installed from the underside of the wing when absolute prevention of wing fold or spread is desired.

153. **AUTOMATIC FLIGHT CONTROL SYSTEM.** The automatic flight control system provides autopilot and automatic throttle control (ATC). Autopilot provides commands to the electronic flight control system to maintain a constant heading, altitude, or attitude. ATC positions the engine throttle levers and power lever control to maintain a constant angle of attack during landing, with approach power compensation (APC), or a constant airspeed during flight, with velocity control system (VCS).

154. MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM - F/A-18A AND F/A-18B.

155. The maintenance status display and recording system (MSDRS) monitors engine and airframe operational status for unit failures and caution/advisory conditions when the mission computer system is operating. The MSDRS sends data to the mission computer system for processing. When the mission computer system detects a caution/advisory condition, it commands the multipurpose display group to display the applicable caution or advisory message in the cockpit. If the mission computer system detects a unit failure, it commands the MSDRS to store the applicable maintenance code. When the mission computer system detects specific unit failures, it commands the MSDRS to record significant maintenance data and selected tactical information on magnetic tape. The pilot commands the recording of inflight engine condition monitoring data from the cockpit. When manually activated by maintenance personnel, the MSDRS monitors for low fluids data independent of the mission computer system. Maintenance personnel manually activate the MSDRS to display stored maintenance codes.

156. The MSDRS is made up of the Signal Data Recording Set AN/ASM-612 and the fatigue strain gages. The Signal Data Recording Set AN/ASM-612 is made up of the signal data converter, the Signal Data Recorder RO-508/ASM-612 (recorder), the Magnetic Tape Cartridge MX-9972/ASM-612 (cartridge), and the nose wheelwell DDI.

157. **SIGNAL DATA CONVERTER.** The signal data converter receives analog data from engine sensors and discrete data from other non-avionic systems, and converts this data from analog or discrete form to digital data words. The signal data converter sends digital data over the MSDRS mux to the recorder and, in addition, supplies excitation voltage to and receives airframe fatigue strain data from aircraft fatigue strain gages.

158. **SIGNAL DATA RECORDER RO-508/ASM-612.** The recorder receives serial digital data from the signal data converter and discrete data, which it converts to digital data, from non-avionic systems. The recorder holds data in temporary storage until requested by the mission computer system. The recorder, upon command by the mission computer, transfers data from temporary storage to the cartridge. It receives maintenance codes from the mission computer which it stores in memory and sends to the nose wheelwell DDI for storage and display.

159. **MAGNETIC TAPE CARTRIDGE MX-9972/ASM-612.** The cartridge receives processed maintenance, tactical, and fatigue strain data from the recorder. It stores and retrieves digital data at a rate of up to 30,000 bits per second on four available tracks with a packing density of 3000 bits per inch. It has 90 feet of magnetic tape.

160. **NOSE WHEELWELL DDI.** The nose wheelwell DDI receives and stores maintenance codes from the recorder, and provides a visual display of stored maintenance codes on operator request. The nose wheelwell DDI provides for manual activation of MSDRS to perform fluids level test of consumable fluids. Provisions are incorporated for nose wheelwell DDI built-in test/reset resulting in clearing of all stored maintenance codes from nose wheelwell DDI, recorder, and mission computer system.

161. **FATIGUE STRAIN GAGES.** Fatigue Strain gages are bonded to the aircraft at seven different locations. There are two strain gages at each location. At each location one strain gage functions

as the primary strain gage. Its wires are spliced to aircraft wiring. The other strain gage functions as a backup. The strain gages receive 10vdc excitation from the converter and, after sensing fatigue strain, produce an output proportional to the amount of strain sensed. The fatigue strain data is sent through the converter to the recorder. The recorder sends the fatigue data to the mission computer system. The mission computer system processes the data. When a strain reversal of 10 percent or greater occurs, the mission computer system commands the recorder to record the fatigue strain data and selected tactical data on the cartridge tape.

162. FLIGHT INCIDENT RECORDER AND MONITORING SYSTEM - F/A-18C AND F/A-18D.

163. The flight incident recorder and monitoring system (FIRAMS) monitors engine and airframe operational status for unit failures and caution/advisory conditions when the mission computer system is operating. The FIRAMS sends data to the mission computer system for processing. When the mission computer system detects a caution/advisory condition, it commands the multipurpose display group to display the applicable caution or advisory message in the cockpit.

164. If the mission computer system detects a unit failure, it commands the FIRAMS to store the applicable maintenance code. When the mission computer system detects specific unit failures, it commands the FIRAMS to store significant maintenance data and selected tactical information in a solid state memory device.

165. The FIRAMS controls, measures, monitors, and fault isolates the fuel system. The FIRAMS provides engine data, fuel quantity and time displays in the cockpit. The pilot commands the recording of inflight engine condition monitoring data from the cockpit. When manually activated by maintenance personnel, the FIRAMS monitors for low consumables data independent of the mission computer system. Maintenance personnel manually activate the FIRAMS to display stored maintenance codes.

166. **SIGNAL DATA COMPUTER.** The signal data computer is a programmable digital computer which provides a hardware interface with non-avionic aircraft systems. The signal data computer monitors discrete and analog inputs from the non-avionic systems and converts them to digital outputs. The signal data computer sends the digital outputs to the mission computer system for processing.

167. The signal data computer receives maintenance codes from the mission computer system and stores them in memory. When manually commanded by maintenance personnel, the signal data computer sends maintenance codes to the nose wheelwell aircraft maintenance indicator for display.

168. The signal data computer software controls, measures, monitors, and fault isolates the fuel system. The signal data computer sends maintenance codes, engine data, fuel quantities and time to the integrated fuel-engine indicator(s) for display. The signal data computer supplies excitation voltages to the fuel quantity transmitters, fuel pressure transducers and aircraft fatigue strain gages.

169. **MEMORY UNIT.** The memory unit (MU) is a programmable digital computer which serves as a non-volatile solid state memory device. The MU is a plug-in unit which is cockpit mounted for easy installation and removal by the pilot. The MU communicates with the mission computer system to provide non-volatile recording of aircraft maintenance code history, fatigue strain, and tactical data. The MU has the capability of storing a program to be done without interfering with normal operation.

170. **MEMORY UNIT MOUNT.** The memory unit mount provides a mounting receptacle for the MU. The memory unit mount provides the electrical interface between the memory unit and aircraft wiring.

171. **NOSE WHEELWELL DDI.** The nose wheelwell DDI provides for manual activation of the signal data computer to do a consumables level test. On operator request, the nose wheelwell DDI receives and displays maintenance codes from the signal data computer. A manually activated nose wheelwell DDI built-in test, if successfully completed, clears all maintenance codes stored in the signal data computer and the mission computer system. The nose wheelwell DDI provides for manual selection of primary or backup fatigue strain gages as the source for aircraft fatigue strain data recording.

172. **INTEGRATED FUEL-ENGINE INDICATOR ID-2389/A.** The integrated fuel-engine indicator (IFEI) receives display data from the SDC. When manually activated in the normal mode the IFEI displays engine data, fuel quantities, and time. The normal mode also provides for the selection of a bingo fuel setting. When manually activated in the maintenance mode the IFEI commands the SDC to do a consumables level test. The maintenance mode also provides a display of maintenance codes stored in the signal data computer.

173. **REAR INTEGRATED FUEL-ENGINE INDICATOR ID-2389/A - F/A-18D.** The rear integrated fuel-engine indicator serves the same purpose in the rear cockpit as the IFEI in the forward cockpit.

174. **FATIGUE STRAIN GAGES.** Fatigue strain gages are bonded to the airframe at seven different locations There are two strain gages at each location. At each location one strain gage functions as the primary strain gage. The other strain gage functions as a backup. All primary and backup strain gages provide inputs to the SDC. The SDC uses primary inputs for fatigue strain data processing until the primary strain gage at a location is determined to be defective. Then the backup input is used. The AMI provides for manual selection between primary and backup strain gages as the source of fatigue strain data from each location.

175. The strain gages receive 10vdc excitation from the SDC. When sensing fatigue strain, the strain gages produce an output to the SDC proportional to the amount of strain sensed. The SDC sends the fatigue strain data to the mission computer system. The mission computer system processes the data. When a strain reversal of 10 percent or greater occurs, the mission computer system commands the recording of fatigue strain data and selected tactical data in the MU.

176. DEPLOYABLE FLIGHT INCIDENT RECORDER SET (DFIRS) - 164725 AND UP; ALSO 164627 THRU 164724 AFTER F/A-18 AFC 126.

177. The Deployable Flight Incident Recorder Set (DFIRS) has two functions; the storage of flight data and the deployment of this data. The DFIRS signal data recorder and DFIRS data transfer interface unit provide flight data storage. The DFIRS front mount, rear mount, underwater initiator, impact initiator, severable door, thin layer explosive and shielded mild detonating cord provide recorder deployment.

178. **DFIRS SIGNAL DATA RECORDER.** The recorder provides the functions for storage of flight data in the memory unit and crash location is provided by the beacon. The recorder airfoil structure provides the aerodynamics and structural characteristics necessary to make sure of surviveability on deployment, inflight and on impact.

179. The recorder contains a memory unit, beacon, antenna, and battery.

180. The memory unit is the controller for interpreting serial messages and doing memory operations. The memory unit contains the bulk memory for flight data storage and auxiliary memory to support flight data storage. Thirty minutes of continuous flight data is stored. The auxiliary memory does data integrity checksums for the bulk memory, bad block mapping, tracks DFIRS data transfer interface unit elapsed time and contains the write protect status. The auxiliary memory monitors the number of current write protect areas and the status of any currently active write protect operations. For each of the defined write protect areas a start and stop address is stored. Three write protect areas can be stored at one time.

181. When the recorder is deployed, the beacon alternates between a continuous wave and distinctive audio modulated transmission on the military UHF guard frequency of 243 MHz. The antenna is an integral part of the recorder and transmits signals in all directions. This transmission is detectable by search and rescue satellite, aircraft guard receivers and direction finders.

182. The battery supplies power to operate the beacon for at least 72 hours.

183. **DFIRS DATA TRANSFER INTERFACE UNIT.** The interface unit communicates with the mission computer (MC1) and the deployable flight incident recorder. MC1 communicates with the interface unit by way of mux channel 2. The interface unit sends commands to the deployable flight incident recorder to retrieve and store data in the deployable flight incident recorder memory unit.

184. **DFIRS FRONT MOUNT.** The front mount guillotine and piston are activated when the pyrotechnic initiation signal is received. The guillotine severs the recorder cable. The piston activates the recorder beacon activation switch and thrusts the recorder into the airstream. When the recorder is installed, the DFIRS front mount switch sends a DFIRS installed signal to the signal data computer.

185. **DFIRS REAR MOUNT.** The rear mount has two mounting pins that secure the rear of the DFIRS recorder. When the recorder is deployed, the rear mount holds the recorder trailing edge until the proper angle of attack and provides lateral stability for initial trajectory.

186. **IMPACT INITIATOR.** The impact initiator is activated when sufficient G loads exist.

187. **UNDERWATER INITIATOR.** The underwater initiator is activated when the aircraft reaches a depth of 15 to 25 feet.

188. **SEVERABLE DOOR (DOOR 63L).** When the door flexible linear shaped charge is activated, the charge cuts an opening in the door allowing the DFIRS signal data recorder to be deployed.

189. **SMDC AND TLX.** The shielded mild detonating cord (SMDC) provides the explosive stimulus from the emergency escape system to the thin layer explosive (TLX) lines. The TLX lines provide the explosive stimulus to operate the front mount and activate the severable door flexible linear shaped charge.

189A. CRASH SURVIVABLE FLIGHT INCIDENT RECORDING SYSTEM (CSFIRS) - 163429 THRU 164279 AFTER F/A-18 AFC 258.

189B. The Crash Survivable Flight Incident Recording System (CSFIRS) records digital flight data recieved from digital data computers 1 and 2 (MC) on MUX channel 2. CSFIRS components are the voice/data recorder and the acoustic beacon. Analog voice data recording capability is not used at this time. A minimum of thirty minutes of flight data is recorded and stored in the voice/data recorder. The acoustic beacon is mounted to the voice/data recorder and is capable of withstanding high-g impact and deep water immersion.

189C. **VOICE/DATA RECORDER.** The voice/data recorder provides the functions for acquisition and crash protected storage of flight data. The voice/data recorder has the capability to record thirty minutes of both digital and analog inputs. Digital flight data is received from the MC over MUX channel 2. Flight data is stored in the voice/data recorders crash protected memory (CPM).

189D. The CPM contains the mass storage medium and circuitry necessary to read, write and erase sixteen bit words via the mux bus interface. The voice and flight data within the CPM is overwritten starting with the oldest data when memory capacity has been reached. CSFIRS data is downloaded to the memory unit (MU) either automatically or by pressing the DFIRS (CSFIRS) DWNLD push-button switch on the cockpit DDI engine monitor display. The CPM is encased in a crash survivable housing to ensure survivability during and after an aircraft mishap.

189E. **ACOUSTIC BEACON.** The acoustic beacon is mounted to the voice/data recorder. The acoustic beacon consists of an electronic module, self contained battery and a transducer. It is housed in a cylindrical watertight aluminum case capable of withstanding high-g impact shock and deep water immersion.

189F. The self contained battery supplies power to the beacon upon activation of a water-sensitive switch. Upon activation the beacon radiates a pulsed acoustic signal for a period of 30 days at 37.5 KHz.

190. COMMUNICATION, TACAN, ADF, ELECTRONIC ALTIMETER, AND IFF SYSTEMS.

191. COMMUNICATION SYSTEM.

a. F/A-18A 161353 THRU 161987, F/A-18B; ALSO F/A-18A 162394 THRU 162477 BEFORE F/A-18 AFC 292, F/A-18 162826 THRU 163175 BEFORE F/A-18 AFC 253 OR F/A-18 AFC 292, AND F/A-18C AND F/A-18D 163427 THRU 164912 BEFORE F/A-18 AFC 185, VHF/UHF Communication System. The VHF/UHF communication system provides air-to-air and air-to-ground communications on 11,960 frequencies on 20 preset channels, a guard (G) channel and manual (M) channel within the range of 30.0 to 399.975 MHz. The system is made up of two receiver-transmitters which continuously monitor an internal guard receiver for the band selected. When operated with the KY-58, a secure voice mode is provided. Backup frequency selection is provided by the right or left digital display unit.

b. F/A-18C AND F/A-18D 164945 AND UP; ALSO F/A-18A 162394 THRU 162477 AFTER F/A-18 AFC 292, F/A-18A 162826 THRU 163175 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292, AND F/A-18C AND F/A-18D 163427 THRU 164912 AFTER F/A-18 AFC 185, VHF/UHF Communication System. The VHF/UHF communication system provides air-to-air and air-to-ground plain or secure communications in fixed frequency mode, anti-jam (ECCM) mode, or maritime mode. The system operates on 20 preset channels (fixed frequency mode or anti-jam mode) guard (G) channel, manual (M) channel, cue (C) channel, and 55 maritime (S) channels, within the range of 30 to 399.975 MHz. The system is made up of two VHF/UHF receiver-transmitters (receiver-transmitters), which continuously monitor the received RF for a transmission on the guard (emergency) channels. Secure communications are available, when the receiver-transmitters are operated with the KY-58. Backup frequency selection, in the fixed frequency mode only, is provided by the right or left digital display unit.

c. F/A-18C AND F/A-18D 163427 THRU 165687 AFTER F/A-18 AFC 269 WITH DCS INSTALLED, Digital Communication System (DCS). The DCS, when installed as VHF/UHF receiver-transmitter no. 2, does all of the current VHF/UHF receiver-transmitter no. 2 functions. The DCS uses a variable message format to transmit and receive digital data communications from forward air controllers for weapon targeting, mission information, and navigational systems. The DCS also includes an embedded KY-58 function which allows both VHF/UHF receiver-transmitters to simultaneously operate in cipher mode at the same time.

d. Intercommunication and Audio System. The intercommunication amplifier-control provides amplification and routing of audio signals between cockpit, ground crew, and rear cockpit. It also provides supplemental and backup CNI controls, combined aircraft threat warnings and advisories, weapon tones, and voice alerting.

192. **TACAN SYSTEM.** The TACAN system is used to determine the relative bearing and slant range distance to a TACAN ground station or a similar TACAN equipped aircraft. The TACAN is also used as a source to keep aircraft present position and to update the aircraft present position being kept by another source (INS or ADC). F/A-18C AND F/A-18D AFTER F/A-18 AFC 270, the multifunctional information distribution system (MIDS) may be installed instead of TACAN.

193. **MULTIFUNCTIONAL INFORMATION DISTRIBUTION SYSTEM-F/A-18C AND F/A-18D AFTER F/A-18 AFC 270.** The (MIDS) is an advanced, high capacity, jam resistant, digital communication link used for the exchange of near real-time information with elements engaged in tactical air and ground operations. The digital link can be used to transfer both voice and data among platforms. The MIDS system also serves as a navigation aid by providing TACAN and precise relative navigation position keeping functions. The TACAN system can be install if MIDS is not available.

194. **ADF SYSTEM.** The ADF system provides relative bearing to the station selected. The station is selected by VHF/UHF receiver-transmitter no. 1 or no. 2. The bearing is displayed on the horizontal indicator in the form of a small circle.

195. **ELECTRONIC ALTIMETER SYSTEM.** The electronic altimeter system indicates clearance over land or water from 0 to 5000 feet. Operation is based on precise time for a pulse to travel from the aircraft to the earths surface and return. Audio and visual warnings are activated when the aircraft is at

or below a selected low altitude limit. Altitude information is displayed on the height indicator or on the head-up display (HUD).

196. **IFF SYSTEM.**

a. F/A-18A 161353 THRU 161987, F/A-18B AND 163427 THRU 163782; ALSO F/A-18A 162394 THRU 163175 BEFORE F/A-18 AFC 292 AND 163985 THRU 165221 BEFORE F/A-18 AFC 236. The IFF system provides automatic identification function for the aircraft. The system receives challenging signals and determines correct code and mode of challenge, and automatically transmits a coded reply. The system operates in modes 1, 2, and 3A, which are selective identification feature (SIF) modes, and in mode C, altitude reporting mode. Mode 4, which is a crypto mode, is available when the mode 4 computer is installed. SIF mode replies can be modified by actuating the IP (identification of position) function or by actuating the emergency function.

b. 165222 AND UP; ALSO F/A-18A 162394 THRU 162826 AFTER F/A-18 AFC 292 AND 163985 THRU 165221 AFTER F/A-18 AFC 236. The CIT (combined interrogator/transponder) operates as a standard IFF (identification friend/foe) system. The CIT allows positive identification of cooperative targets beyond visual range. The system operates in modes 1, 2, and 3/A, which are selective identification feature (SIF) modes, and in mode C, the altitude reporting mode. Mode 4 is the secure mode that provides true friend identification and protects the identification from spoofing and exploitation. Level 1 mode S capability is provided for transponder operation. Electronic IFF is divided into two parts, a transponder and an interrogator.

(1) Transponder Mode. As a transponder, the CIT receives interrogations from the L band section of two communication system antennas. It determines correct code and mode of challenge, and automatically transmits a coded reply by way of the antenna which receives the strongest signal. SIF mode replies can be modified by actuating the IP (identification of position) function or by actuation of the emergency function. Transponder modes and codes can be selected and changed by selecting the transponder (XP) IFF format on the electronic equipment control UFC.

(2) Interrogator Mode. As an interrogator, the CIT transmits challenges and decodes replies to provide target identification. When used with other sensors, the CIT aids situational awareness. CIT target reports are correlated with target information from other sensors and displayed on the tactical formats when MSI is active or with radar as the sole contributor.

(a) The UFC provides the manual means of enabling and changing the interrogator modes and codes.

(b) The interrogator control options are selectable from the Az/El display. Both pointed and scan interrogations can be commanded.

197. DATA LINK, INSTRUMENT LANDING, AND RADAR BEACON SYSTEMS.

198. **DATA LINK SYSTEM.** The data link system provides a communications link between the aircraft and controlling tactical data systems (airborne, shipboard, or ground). Digitally encoded control messages from the tactical data system are decoded and processed by the data link system to supply digital and analog outputs. These outputs are used in different phases of operation for automatic control of the aircraft by coupling them to the autopilot, or for pilot control by way of information displays. Operational phases of the data link system include an automatic carrier landing phase, a vector phase, and waypoint/alignment INS phases. Coded reply messages containing aircraft tactical data are transmitted to the controlling tactical data system during the vector phase.

199. **INSTRUMENT LANDING SYSTEM.** The instrument landing system AN/ARA-63 (ILS) is an all weather approach guidance system. The ILS operates with an aircraft carrier installation transmitting set AN/SPN-41, or a ground installation transmitting set AN/TRN-28. The ILS decodes transmitted azimuth and elevation signals during an aircraft approach and provides steering information to be displayed on the head-up display (HUD), the attitude reference indicator or the electronic ADI indicator display. The ILS can be activated by three modes of operation. These three modes are the primary mode, which uses the upfront control to control the ILS, the backup mode, which uses the intercommunication panel to control the ILS, and the automatic carrier landing (ACL) mode, which uses the mission computer system to control the ILS when the data link system is in ACL mode.

200. **RADAR BEACON SYSTEM.** The radar beacon is used to improve the tracking capabilities of ground based radars and the shipboard radar during data link ACL operation. The ground based radars that interrogate the radar beacon transponder are transported to forward areas and used to vector the aircraft to specific targets. The radar beacon extends the ground based radar tracking range by receiving the interrogating pulse and transmitting a reply, which is considerably stronger than a radar echo. In the data link ACL mode, the radar beacon increases the tracking capability of the shipboard radar. This improves the accuracy of the guidance commands from the carrier to the aircraft during the automatic carrier landing.

201. INERTIAL NAVIGATION, AND BACKUP ATTITUDE AND NAVIGATION SYSTEMS.

202. **INERTIAL NAVIGATION SYSTEM - 161353 THRU 161924, 163427 AND UP; ALSO 161925 THRU 163175 BEFORE F/A-18 AFC-231.** The inertial navigation system (INS) is a self-contained, fully automatic dead reckoning navigation system. On 164945 AND UP, ALSO 163427 THRU 164912 AFTER F/A-18 AFC-175 PART 2, the INS is closely coupled by the mission computer with the global positioning system (GPS) to provide highly accurate aircraft present position and velocity data. The INS detects aircraft motion (acceleration and attitude) and provides acceleration, velocity, present position, pitch, roll, and true heading to related systems. The INS uses both periodic and initiated built-in test (BIT). The periodic BIT monitors essential voltage parameters within the system and provides all inflight, shipboard, and ground failure detection and isolation. Initiated BIT is done on the ground and completes that portion of the failure detection and isolation which periodic BIT is unable to do.

203. **BACKUP ATTITUDE AND NAVIGATION SYSTEM.** If a failure occurs in the primary attitude and navigation systems (GPS and INS), output signals of pitch, roll, magnetic heading, and airspeed are provided to the mission computer system for use in the backup attitude and navigation computations. The backup system is made up of an attitude reference indicator (ARI), a static power inverter, a magnetic azimuth detector, and a standby compass. The ARI is a self-contained attitude reference system which provides backup pitch and roll attitude for use by other systems. If there is a power interruption to the ARI, dc power is applied to the inverter which in turn produces ac power for ARI operation. The magnetic azimuth detector detects the magnetic heading. The air data computer processes the detected magnetic heading and develops the magnetic error compensation

signals. The standby compass is a magnetic compass which continuously indicates aircraft heading with reference to the earth magnetic field and is used when the heading reference fails.

203. WEAPON CONTROL SYSTEMS.

204. The weapon control systems include the systems listed below:

a. On 163427 THRU 165206 armament monitor and control (AMAC) system.

b. Stores management systems (SMS).

c. Suspension and release mechanisms.

d. Electrical boresight compensation system.

205. **ARMAMENT MONITOR AND CONTROL SYSTEM - 161925 THRU 165206; ALSO 161353 THRU 161924 AFTER F/A-18 AFC 57 AND BEFORE F/A-18 AFC 160.** The AMAC system controls and monitors the nuclear weapons loaded on the two outboard Aircraft Wing Pylons SUU-63( ) on weapon stations 2 and 8. The AMAC is made up of a AMAC CONTROL in the cockpit and two Encoder-Decoder-Power Supplies KY-842/AWB-3(V) in the weapon station pylons. Power to the AMAC system is controlled by a NUC WPN (ENABLE/DISABLE) switch on the left canopy sill.

206. The system provides primary electrical signal interface with nuclear weapons. The stores management system provides the release function for the nuclear weapons.

207. The control monitor is installed in the right console when the aircraft is configured for nuclear weapons and replaced with the AMAC dummy receptacle panel when not needed.

208. **ARMAMENT MONITOR AND CONTROL SYSTEM - F/A-18D 164866 THRU 165206; ALSO 163986 THRU 164738 AFTER F/A-18 IAFC 160.** The AMAC system controls and monitors the nuclear weapons loaded on the two outboard Aircraft Wing Pylons SUU-63( ) on weapon station 2 and 8. The AMAC system is made up of a AMAC CONTROL in the cockpit, AFT NUC Consent Control panel in the aft cockpit and two Encoder-Decoder-Power-Supplies KY-842/AWB-3 (V) in the weapon station pylons. Power to the AMAC is controlled by the NUC WPN (ENABLE/DISABLE) switch on the left canopy still.

209. The control monitor is installed in the cockpit right console and the AFT NUC consent control panel is installed in the aft cockpit right console when aircraft is configured for nuclear weapons and replaced by dummy panels when not needed.

210. Both the AMAC CONTROL and the AFT NUC consent control panel release consent switch must be set to ON, to enable the release consent circuits.

211. With non-nuclear weapon loaded on station 2 and 8 both the AMAC dummy receptacle panel and the aft nuclear consent dummy panel must be installed to enable the release consent circuits.

212. On 165207 AND UP with weapon loaded on station 2 and 8 both the release consent dummy panel and the aft release consent dummy panel must be installed to enable the release consent circuits.

213. **STORES MANAGEMENT SYSTEM.** The SMS provides inventory and status determination, selection, preconditioning, release, and jettison functions for the nine weapon stations and the M61A1 or M61A2 20mm automatic gun system. On 163427 THRU 165206 it is made up of an Armament Control Processor Set AN/AYQ-9(V), a Command Launch Computer CP-1001( )/AWG (CLC) and Electrical Fuzing Power Supply PP-6419/AWW-4(V). On 165207 AND UP it is made up of an Armament Control Processor Set AN/AYK-22(V) and Command Launch Computer CP-1001( )/AWG (CLC).

214. **Armament Control Processor Set.** On 163427 THRU 165206 the armament control processor set is made up of the Armament Computer CP-1342/AYQ-9(V) and nine Command Signal Encoder-Decoders KY-85( )/AYQ-9(V) (encoder-decoders). On 165207 AND UP the armament control processor set is made up of the Armament Computer CP-2218/AYK-22(V), six Signal Data Converter Computers CV-4257/AYK-22(V)(SDCC) and two Command Signal Encoder-Decoders KY-85( )/AYQ-9(V). Communication between the armament computer and the encoder-decoders/SDCC is by way of the armament mux bus, which is separate from the avionic MUX bus. Multiplex data on the armament mux bus allows the armament computer to monitor

and control the weapon stations and gun system. Mission computer interface is provided by avionic mux channel.

215. **Command Launch Computer.** The command launch computer (CLC) controls and monitors the high speed anti-radiation missile (HARM). The CLC interfaces the armament computer by way of discrete signals to provide HARM data to the selected weapon station. Mission computer system interface is provided by avionics mux channel.

216. On 161925 AND UP; the CLC interfaces with Countermeasures Computer CP-1293/ALR-67(V) for weapon control, mode, and threat priority logic.

217. **Electrical Fuzing Power Supply.** On 163427 THRU 165206 the electrical fuzing power supply provides the electrical fuzing function of the SMS for weapons requiring electrical fuzing. The power supply is controlled by discrete signals from the armament computer. On 165207 AND UP the armament computer provides electrical fuzing function to the SMS weapon requiring electrical fuzing.

218. **SUSPENSION AND RELEASE MECHANISMS.** The suspension and release mechanisms for the nine weapon stations are made up of pylons, launchers, and racks. Weapon stations 2, 3, 5, 7, and 8 are pylon stations. Aircraft Wing Pylon SUU-63( ) are used on stations 2, 3, 7 and 8. Aircraft Fuselage Centerline Pylon SUU-62( ) is used on station 5. Pylons are installed on these stations, as required for the aircraft mission. Each one has a parent rack, Aircraft Bomb Ejector Rack BRU-32( ), which is part of the pylon. Stores and weapons or launchers/racks attach to the BRU-32( ). Aircraft Guided Missile Launcher LAU-116( ) for the fuselage-mounted AIM-7/AIM-120 missiles and the Guided Missile Launcher LAU-7( ) for wingtip-mounted AIM-9 sidewinders attach directly to the aircraft.

219. **ELECTRICAL BORESIGHT COMPENSATION SYSTEM.** The electrical boresight compensation system provides a method to compensate for component boresight errors in roll, pitch, and yaw axis without the use of shims or mechanical adjustments. Electrical boresight compensation is provided for the components listed below:

a. Head-up display unit (HUD)

b. On 163427 THRU 165206 M61A1 or M61A2 20MM Automatic Gun

c. On 165207 AND UP or M61A2 20MM Automatic Gun

d. Radar Set AN/APG-65

e. Forward Looking Infrared System, AN/AAS-38( )

f. Laser Detector-Tracker/Strike Camera Set, AN/ASQ-173

g. Navigation Infrared Receiving System, AN/AAR-50

220. This system also provides identification of the aircraft configuration to the mission computer system and last five digits of the aircraft bureau number.

221. **Electrical Boresight Compensation Assembly - 161353 THRU 161528 BEFORE F/A18 AFC 20.** The electrical boresight compensation assembly (EBCA) has four thumbwheel switch assemblies (compensation switches) to enter boresight correction factors and aircraft configuration. A fifth thumbwheel switch assembly is used to enter the aircraft bureau number for identification.

222. **Electrical Boresight Compensation Assembly - 161702 AND UP; ALSO 161353 THRU 161528 AFTER F/A18 AFC 20.** The electrical boresight compensation assembly (EBCA) has five thumbwheel switch assemblies (compensation switches) to enter boresight correction factors and aircraft configuration. A sixth thumbwheel switch assembly is used to enter the aircraft serial number for identification.

223. **AIM-7 Illumination Antenna System.** The AIM-7 Illumination Antenna System enables a sample or the radar transmitter frequency to be sent to AIM-7 missiles for tuning.

224. The system consists of an RF coupler, four antennas and the necessary RF coax cables to route the transmitter signal from the radar transmitter to the four antennas. The antennas are located on the aircraft to point to the rear of the AIM-7 missile when loaded on weapon stations 2, 4, 6 and 8. The missile receives the radar transmitter sample and tunes to the frequency. When tuned, the missile provides a tuned signal to the Stores Management System for display and release logic.

225. **LOCK/SHOOT Light System.** The LOCK/SHOOT light system provides a visual indicator for radar lockon (LOCK light) and, when weapon release interlocks are satisfied, also provides SHOOT light/shoot cue. The light functions are enabled during AIM-7 sparrow, AIM-9 sidewinder, and gun delivery.

226. The LOCK/SHOOT light assembly is located on the canopy arch in the cockpit to provide the pilot with a visual indication of lock and shoot status during hands on throttle and stick (HOTAS) operation. The strobe light is a high intensity light that flashes as a function of the SHOOT light. The strobe light is disabled during night flight by the cockpit caution/warning/advisory lighting system. These lights are turned on and off by discrete signals from the mission computer (MC) system. The MC system also provides shoot cue displays for the head-up display unit and radar displays.

227. 20MM GUN SYSTEM.

228. On 163427 THRU 165206 the M61A1 or M61A2 20MM automatic gun system provides the pilot with the ability to fire the high performance M61A1 or M61A2 automatic gun. On 165207 AND UP the M61A2 20MM automatic gun system provides the pilot with the ability to fire the high performance M61A2 automatic gun. The system has a capacity of approximately 578 rounds of ammunition. The rate select switch provides for the selection of either 4000 or 6000 shots per minute. The system is electrically controlled by the stores management set and hydraulically powered by the aircraft hydraulic system. During gun fire, the gun gas purge air flow valve is opened. This allows engine bleed air to evacuate gun gas from the breech area through louvers in the lower moldline. More gun gas control is provided by a hydraulically actuated ram air scavenge door which automatically opens during gun fire. On 163427 THRU 165206 the M61A1 or M61A2 automatic gun and ammunition handling system are a palletized assembly. On 165207 AND UP the M61A2 automatic gun and ammunition handling system are a palletized assembly.

229. The 20MM gun system is installed in the nose of the aircraft. The 20MM gun system is made up of the M61A1 or M61A2 automatic gun, feed chutes, conveyor elements, feed units, unloader units, transfer units, ammunition storage drum, hydraulic and mechanical drive units. The gun mounts are mounted into the aircraft nose section to a close tolerance. The palletized 20MM gun system is then installed into the aircraft without other adjustment.

230. MISSION COMPUTER SYSTEM.

231. The mission computer system is made up of two digital data computers (no. 1 and no. 2), a control-converter, an electronic equipment control a MC/HYD ISOL control panel, mux bus impedance matching networks. and on F/A-18B AND F/A-18D, a rear electronic equipment control. Mission computer system functions are as listed below:

a. Computes and controls the data sent to the multipurpose display group.

b. Computes and produces missile launch and weapon release commands.

c. Provides mode control and option select for various avionics systems.

d. Provides mode control and option select data from the multipurpose display group to avionics systems for control and computation.

e. Outputs built-in test (BIT) initiate signals to various avionics systems and monitors BIT status.

232. The two digital data computers are high speed general purpose computers with core memory. The computers communicate with the avionic systems using mux avionic buses and use avionic mux bus three to communicate with each other.

233. The control-converter is an interface unit between the electronic equipment control, digital data computers, non mux avionic and non avionic systems. The control-converter contains a central precessing unit and a fixed program and is controlled by the electronic equipment control or digital data computers.

234. The electronic equipment control and on F/A-18B AND F/A-18D, the rear electronic equipment control contains switches and display functions required to control communication, navigation, and identification systems and provides a medium for manual entry of delivery program data.

235. On the MC/HYD ISOL control panel, the MC switch is used for digital data computer fault isolation while the HYD ISOL switch is used for hydraulic system operation.

236. The mux bus impedance matching networks are used to terminate the dual bus avionic mux channels in their characteristic impedance.

237. RADAR SYSTEM.

238. The radar system is made up of Radar Set AN/APG-65 - 161353 THRU 164279; ALSO 164627 THRU 164897 BEFORE F/A-18 AFC 211 or Radar Set AN/APG-73 - 164898 AND UP; ALSO 164627 THRU 164897 AFTER F/A-18 AFC 211 and associated controls and indicators. The radar system functions are listed below:

a. Detection of air and surface targets.

b. Air target range, range rate, antenna angles, and antenna rates for use in computation of weapon parameters and launch equations.

c. Automatic acquisition of short range targets.

d. Track of air and surface targets.

e. Target illumination for AIM-7 missiles.

f. Air-to-ground (A/G) mapping.

g. Air-to-air (A/A) and A/G display data.

h. Terrain avoidance.

i. Precision velocity update.

239. **RADAR SET AN/APG-65 - 161353 THRU 164279; ALSO 164627 THRU 164897 BEFORE F/A-18 AFC 211 OR RADAR SET AN/APG-73 - 164898 AND UP; ALSO 164627 THRU 164897 AFTER F/A-18 AFC 211.** The radar set provides A/A and A/G modes for target detection, designation, tracking, and navigation. It also provides the rf energy for AIM-7 missile tuning and post launch guidance. For A/A operation, a high/medium pulse repetition frequency (prf) pulse doppler mechanization provides both long range headon and tail aspect target detection. Track while scan (TWS) and raid assessment modes assist in threat evaluation. For A/G operation, real beam surface map and A/G ranging modes assist in navigation and A/G weapon delivery. High resolution surface mapping is provided using doppler beam sharpening techniques. The radar set also provides terrain avoidance for low level navigation, a detection and tracking capability for moving surface targets, and precision velocity measurement for navigation update and improved weapon delivery accuracy.

240. MULTIPURPOSE DISPLAY GROUP.

241. **MULTIPURPOSE DISPLAY GROUP - 161353 THRU 163782.** The multipurpose display group (MDG) is made up of the components listed below:

a. head-up display unit (HUD)

b. Indicator Group OD-150(V)/A

c. control display select panel F/A-18B 161704 AND UP AND F/A-18D; ALSO F/A-18B 161354 THRU 161360 AFTER F/A-18 AFC 54

d. CRS set and HDG set switches

242. The MDG system provides the displays listed below:

a. aircraft attitude

b. navigation

c. air-to air

d. air-to-ground

e. warning, cautions, and advisories

f. various aircraft checklists

243. The system also displays built-in tests for operational and maintenance fault isolation of aircraft systems.

244. **Head-up Display Unit (HUD).** The HUD is made up of the indicator unit and a combiner assembly, and is the primary flight instrument in the aircraft. It provides flight, navigational steering, and weapon delivery information.

245. Combiner Assembly. The combiner assembly is an optical device with dual combining glasses and mounted on top of the HUD. The combiner assembly reflects the symbology displayed on the HUD crt into the pilot's forward field of view.

246. **Indicator Group OD-150(V)/A.** The indicator group is made up of the left and right digital display indicators (LDDI and RDDI) and the horizontal indicator (HI). The RDDI and LDDI are interchangeable allowing display of the same

information on either indicator. On F/A-18B AND F/A-18D, the rear cockpit has a left, right, and center DDI (CDDI). These three indicators are interchangeable.

247. Left Digital Display Indicator. The LDDI is used primarily for stores management, caution, advisory, and built-in test (BIT) displays. The LDDI also produces the symbology for the HI and provides the interface between the HI and the mission computer system (MC). On F/A-18B AND F/A-18D, the LDDI provides the rear LDDI with identical display information and receives selector pushbutton switch status allowing display selection from the rear cockpit.

248. Right Digital Display Indicator. The RDDI is used primarily for sensor displays. The RDDI also produces requested symbology and provides the interface between the HUD and MC. Air-to-air, air-to-ground, and navigation displays are produced by the RDDI and supplied to the HUD depending on the mode selected. On F/A-18B AND F/A-18D, the RDDI provides the rear RDDI with identical information and receives selector pushbutton switch status allowing display selection from the rear cockpit.

248. Horizontal Indicator (HI)/Rear Center Digital Display Indicator. The HI is used primarily to provide aircraft attitude, steering, and navigation information, with a projected moving map superimposed over the crt display. The symbols to make up the display are generated in the LDDI under MC control. On F/A-18B AND F/A-18D, the HI provides the rear CDDI with identical crt display information and receives selector pushbutton switch status allowing display selection from the rear cockpit. The moving map display is not available in the rear cockpit.

249. **Control Display Select Panel - F/A-18B 161704 AND UP AND F/A-18D; ALSO F/A-18B 161354 THRU 161360 AFTER F/A18 AFC 54.** The control display select panel has the DISPLAY HUD/NORM switch. When the DISPLAY switch is in NORM, the rear LDDI repeats the LDDI display. When in HUD, the rear LDDI has the HUD display.

250. **CRS Set Switch.** The CRS set switch is on the cockpit left main instrument panel. The switch controls the course pointer position and the CSEL course numerical value on the HSI display. The CRS set switch transmits a discrete signal to the LDDI indicating switch position. The LDDI relays the switch position signal to the MC. The MC changes the CSEL course numerical value and course line reference as commanded by the CRS set switch.

251. **HDG Set Switch.** The HDG set switch is on the cockpit left main instrument panel. The switch controls the heading marker position and the HSEL heading numerical value on the HSI display. The HDG set switch transmits a discrete signal to the LDDI indicating switch position. The LDDI relays the switch position signal to the MC. The MC changes the HSEL heading numerical value and the command heading marker position as commanded by the HDG set switch.

252. **MULTIPURPOSE DISPLAY GROUP -163985 AND UP.** The multipurpose display group (MDG) is made up of the components listed below:

a. head-up display unit (HUD)

b. Indicator Group OD-150(V)/A

c. HDG/CRS switch panel

d. rear CRS set and rear HDG set switches

e. left and right hand controllers

253. The MDG system provides the displays listed below:

a. aircraft attitude

b. navigation

c. air-to air

d. air-to-ground

e. warning, cautions, and advisories

f. various aircraft checklists

254. The system also displays built-in tests for operational and maintenance fault isolation of aircraft systems.

255. **Head-up Display Unit (HUD).** The HUD is made up of the indicator unit and a combiner assembly, and is the primary flight instrument in the aircraft. It provides flight, navigational steering, and weapon delivery information.

256. Combiner Assembly. The combiner assembly is an optical device with dual combining glasses mounted on top of the HUD. The combiner assembly reflects the symbology displayed on the HUD crt into the pilot's forward field of view.

257. **Indicator Group OD-150(V)/A.** The indicator group is made up of the left and right digital display indicators (LDDI and RDDI) and the multipurpose color display (MPCD). The RDDI and LDDI are interchangeable allowing display of the same information on either indicator. On F/A-18D, the rear cockpit has a left and right digital display indicator (rear LDDI and rear RDDI). The rear LDDI and rear RDDI are interchangeable. The F/A-18D also has a rear multipurpose color display (rear MPCD). The rear MPCD and MPCD are interchangeable.

258. Left Digital Display Indicator. The LDDI is used primarily for stores management, caution, advisory, and built-in test (BIT) displays. The LDDI also produces stroke symbology for the MPCD and provides interface to the mission computer system (MC). On F/A-18D, the LDDI produces stroke symbology for the rear LDDI and rear MPCD, and provides the interface to the MC.

259. Right Digital Display Indicator. The RDDI is used primarily for sensor displays. The RDDI also

produces requested symbology and provides the interface between the HUD and MC. Air-to-air, air-to-ground, and navigation displays are produced by the RDDI and supplied to the HUD depending on the mode selected. On F/A-18D, the RDDI produces the requested symbology and provides the interface between the rear RDDI and the MC.

260. Multipurpose Color Display/Rear Multipurpose Color Display. The MPCD is used primarily for displaying moving map and overlay symbology (raster display). The raster display is generated by the Digital Map Set AN/ASQ-196 (DMS) under MC control. The MPCD is also used for displaying stroke displays generated by the LDDI under MC control. On F/A-18D, the rear MPCD receives raster video displays from the DMS, and stroke displays from the LDDI under MC control.

261. **HDG/CRS Switch Panel .** The HDG/CRS switch panel is located in the cockpit on the center main instrument panel above the MPCD. The CRS set switch controls the course pointer position and the CSEL course numerical value on the HSI display. The CRS set switch transmits a discrete signal to the LDDI indicating switch position. The LDDI relays the switch position signal to the MC. The MC changes the CSEL course numerical value and course line reference as commanded by the CRS set switch. The HDG set switch controls the heading marker position and the HSEL heading numerical value on the HSI display. The HDG set switch transmits a discrete signal to the LDDI indicating switch position. The LDDI relays the switch position signal to the MC. The MC changes the HSEL heading numerical value and the command heading marker position as commanded by the HDG set switch.

262. **Rear CRS Set Switch.** On F/A-18D, the rear CRS set switch is on the rear cockpit lower L/H instrument panel. The switch controls the course pointer position and the CSEL course numerical value on the HSI display. The rear CRS set switch transmits a discrete signal to the RDDI indicating switch position. The RDDI relays the switch position signal to the MC. The MC changes the CSEL course numerical value and course line reference as commanded by the rear CRS set switch.

263. **Rear HDG Set Switch.** On F/A-18D, the rear HDG set switch is on the rear cockpit lower L/H instrument panel. The switch controls the heading marker position and the HSEL heading numerical value on the HSI display. The rear HDG set switch transmits a discrete signal to the RDDI indicating switch position. The RDDI relays the switch position signal to the MC. The MC changes the HSEL heading numerical value and the command heading marker position as commanded by the rear HDG set switch.

264. **Left And Right Hand Controllers..** On F/A-18D, the left and right hand controllers are located in the rear cockpit on the left and right consoles. The left hand controller interfaces with the MC through the LDDI. The right hand controller interfaces with the MC through the RDDI. The hand controllers provide discrete and analog signals as listed below:

a. hand controller present
b. undesignate
c. harm sequence
d. cage/uncage
e. raid/FOV
f. sensor control(fwd, right, left, aft)
g. radar elevation control
h. throttle designator control (TDC)

265. In addition, the right hand controller provides a chaff/flare discrete and the left hand controller provides an ECM dispense discrete. The radar elevation signal is parallel to both hand controllers and to the right throttle grip in the front cockpit, interfacing with the MC through both RDDI and LDDI.

266. DIGITAL MAP SET AN/ASQ-196 - 163985 AND UP.

267. The Digital Map Set AN/ASQ-196 (DMS) provides:

a. moving map image, continuously updated for tactical and navigational situations.

b. alphanumeric and graphic symbology for tactical and navigational situations. The symbology can be displayed overlaying the moving map or by itself.

c. up to 100 data frames for display. The data frames contain information such as check lists and emergency procedures.

268. The DMS is made up of the components listed below:

a. Digital Map Computer CP-1802/ASQ-196

b. Digital Memory Unit MU-928/ASQ-196

269. **DIGITAL MAP COMPUTER CP-1802/ASQ-196 (DMC).** The DMC is a specialized computer that interfaces with the multipurpose display group and the mission computer system to provide raster displays. The mission computer system controls the DMS raster displays using pushbutton switch inputs from the multipurpose display group.

270. The DMC generates raster displays for the LDDI and RDDI when MAP or MDATA option is selected. Displays are generated for the MPCD when HSI option is selected and when any option except MENU is selected from the HSI display.

271. ON F/A-18C; AND F/A-18D 163986 THRU 164272, the DMC sends monochrome raster displays to the left and right digital display indicators (LDDI and RDDI) and color raster displays to the multipurpose color display (MPCD) by way of dedicated raster video channels. ON F/A-18D 164279 AND UP, only the RDDI receives the monochrome raster displays. ON F/A-18D, the DMC sends color displays to the rear MPCD by way of dedicated raster video channels. The rear LDDI and rear RDDI receive displays from the LDDI and RDDI in the cockpit.

272. **DIGITAL MEMORY UNIT MU-928/ASQ-196 (DMU).** The DMU is an electro-mechanical device that uses an optical disk cartridge for data storage. The DMC controls DMU functions using control messages transmitted by way of fiber optic channels. The DMU processes the control messages, retrieves data stored on the optical disk cartridge, and returns the data to the DMC by way of the fiber optic channels.

273. VIDEO RECORDING AND RECONNAISSANCE SYSTEMS.

274. RECONNAISSANCE SYSTEM - F/A-18D 164649 AND UP RECCE CONFIGURATION.

274A. The Advanced Tactical Air Reconnaissance Set (ATARS) provides high resolution, long range standoff and overflight reconnaissance abilities for day or night and various weather conditions. ATARS uses electro-optical (EO), infrared (IR), and synthetic aperture radar (SAR) sensors for gathering, recording, viewing, and downlink of imagery.

274B. ATARS power is controlled by switches located on the RECCE sensor panel located on the left console in the aft cockpit.

274C. The ATARS is an avionics subsystem made up of avionics equipment loaded on the ATARS pallet and a data link pod mounted on the centerline pylon. The ATARS pallet is located in the aircraft gun bay after the aircraft has been converted to RECCE configuration. The components of the ATARS pallet are listed below:

a. Digital Computer CP-2081/ASD-10(V)

b. Infrared Receiver R-2494/ASD-10(V)

c. Low Altitude Electro-Optical Camera SU-172/ASD-10(V)

d. Medium Altitude Electro-Optical Camera SU-173/ASD-10(V)

e. Electro-Optical Camera Control C-12218/ASD-10(V)

f. Electro-Optical Camera Processor CP-2083/ASD-10(V)

g. Rate Gyro Combination MX-11794/ASD-10(V)

h. Reproducer Recorder Units (2) RD-627/ASD-10(V)

i. Vertical Reference Gyroscope

j. Signal Data Converter CV-4195/ASD-10(V)

k. Magnetic Tape Transport Recorders (2) RD-626/ASD-10(V)

l. Aircraft Converter

m. Circuit Breaker Panel

274D. **DIGITAL COMPUTER CP-2081/ASD-10(V) (DC).** The DC provides management and control functions in support of the ATARS mission. The DC contains the Operational Flight Program (OFP) software necessary to allow interface with all of the ATARS equipment and the aircraft mission

computer, APG-73 Radar Set, and ATARS Data Link subsystem.

274E. **INFRARED RECEIVER R-2494/ASD-10(V) (IR).** The IR provides thermal imaging using a rotating scan mirror controlled by the DC. The IR is able to provide imagery between 200 ft and 3000 ft depending on the field of view setting.

274F. **LOW ALTITUDE ELECTRO-OPTICAL CAMERA SU-172/ASD-10(V) (LAEOC).** The LAEOC is a push broom line-array sensor which produces the ground scene imagery as an array of pixels from aircraft altitudes between 200 ft and 3000 ft at aircraft ground speeds between 300 and 550 knots. LAEOC pointing is controlled by the DC.

274G. **MEDIUM ALTITUDE ELECTRO-OPTICAL CAMERA SU-173/ASD-10(V) (MAEOC).** The MAEOC is a push broom line-array sensor which produces the ground scene imagery as an array of pixels from aircraft altitudes between 3,000 ft and 20,000 ft at aircraft ground speeds between 300 and 550 knots. MAEOC pointing is controlled by the DC.

274H. **ELECTRO-OPTICAL CAMERA CONTROL C-12218/ASD-10(V) (EOCC).** The EOCC provides stabilization control for the MAEOC.

274J. **ELECTRO-OPTICAL CAMERA PROCESSOR CP-2083/ASD-10(V) (EOCP).** The EOCP does video post processing and control functions.

274K. **RATE GYRO COMBINATION MX-11794/ASD-10(V) (RGC).** The RGC is made up of a pitch/yaw gyro assembly (PYGA), a roll gyro assembly (RGA), and a gyro drive electronics assembly (GDEA). The combination of these three components provide MAEOC body attitude and rate data to the EOCC and the MAEOC.

274L. **REPRODUCER RECORDER UNITS (2) RD-627/ASD-10(V) (RRU).** The RRU receive commands from the DC on the 1553 mux bus and sends the data to the MTTR. The RRU also processes data before it is sent to the MTTR for recording. During replay mode, the RRU decode the data coming from the MTTR and outputs the imagery for viewing.

274M. **VERTICAL REFERENCE GYROSCOPE (VRG).** The VRG provides aircraft roll axis orientation to the IR and EOCC.

274N. **SIGNAL DATA CONVERTER CV-4195/ASD-10(V) (SDC).** The SDC does signal processing from the IR.

274P. **MAGNETIC TAPE TRANSPORT RECORDERS (2) RD-626/ASD-10(V) (MTTR).** The main function of the MTTR is to record the video data onto the tape which it carries and to replay the tape during playback mode. One MTTR is designated as primary and the other is secondary. Each is able to record 45 minutes of electro-optical/infrared (EO/IR) imagery or 30 minutes of synthetic aperture radar (SAR) imagery data.

274Q. **AIRCRAFT CONVERTER (AC).** The AC does the power rectification of the 115 VAC three phase primary aircraft power input to provide a 28 VDC output which is used by all ATARS components.

274R. **CIRCUIT BREAKER PANEL.** The ATARS pallet circuit breaker panel contains circuit breakers for ATARS pallet components for overcurrent protection.

275. **VIDEO RECORDING SYSTEM - 161702 THRU 163782; ALSO 161353 THRU 161360 AFTER F/A-18 AFC 54.** The Video Recording System (VRS) records audio from the intercommunication amplifier-control, except for cipher, and the video presentation on the head-up display unit (HUD) or digital display indicators. The components of the VRS are listed below:

a. television camera

b. audio visual recorder

c. Video relay panel assembly

276. **Television Camera.** The television camera mounts on the HUD. Switches on the camera, control system operation. A built-in test (BIT) switch, GO, and NO GO light provide BIT operation for the camera.

277. **Audio - Visual Recorder.** On F/A-18A AND F/A-18C, the audio visual recorder is located in the upper equipment bay. On F/A-18B AND F/A-18D, the audio visual recorder is located in door 14L in place of the Countermeasures Set, when the aircraft is configured for VRS.

278. Audio. The recorder records the audio to and from the pilots headset. Audio is provided to the recorder by the intercommunications and audio system. Audio is not recorded during secure speech operation.

279. Video. Video to the recorder is provided by the multipurpose display group or the television camera. Selection of video for recording is accomplished through the use of VRS switches in the cockpit and rear cockpit. Sources for video are the digital display group and the television camera.

280. Built-In Test. When the VRS is turned on, a RCDR on light on the RH advisory and threat warning indicator panel comes on. The light provides a visual indication that the recorder is operating.

281. BIT for the television camera is provided by a BIT switch that starts BIT and a GO/NO GO indicator light.

282. **VIDEO RECORDING SYSTEM - 163985 THRU 164912.** The Video Recording System (VRS) records audio, except for cipher, from the intercommunications and audio system and the video presentation on the head-up display unit (HUD) or digital display indicators. The components of the VRS are listed below:

a. television camera

b. audio visual recorder

c. video relay panel assembly

283. **Television Camera** The television camera mounts on the HUD. A built-in test (BIT) switch on the television camera controls BIT. A GO, and NO GO light on the television camera provides BIT status information.

284. **Audio - Video Recorder.** On F/A-18A AND F/A-18C, the audio visual recorder is located in the upper equipment bay. On F/A-18B AND F/A-18D, the audio visual recorder is located in door 14L in place of the Countermeasures Set, when the aircraft is configured for VRS.

285. Audio. The recorder records the audio to and from the pilots headset. Audio is provided to the recorder by the intercommunications and audio system. Audio is not recorded during secure speech operation.

286. Video. Video to the recorder is provided by the multipurpose display group or the television camera. Selection of video for recording is accomplished through the use of VRS switches in the cockpit. On F/A-18D, switches in the it rear cockpit along along with cockpit switches are used in video selection. These switches control the audio visual recorder and the video relay panel assembly. Sources for video are the left and right digital display indicators (digital display group) in both the cockpit and rear cockpit along with the television camera.

287. Built-In Test. When the VRS is turned on, a RCDR on light on the RH advisory and threat warning indicator panel comes on. The light provides a visual indication that the recorder is operating.

288. BIT for the television camera is provided by a BIT switch that starts BIT and a GO/NO GO indicator light.

289. **VIDEO RECORDING SYSTEM - 164945 AND UP.** The Cockpit Video Recording System (CVRS) is made up of three cameras and two recorders. The CVRS:

a. records audio from the intercommunications and audio system

b. provides real time color video recording of the reflected stroke and raster video presentation on the head-up display (HUD)

c. records outside world scene along with color recording of the digital display indicators

290. CVRS components are:

a. television camera

b. hi-8mm video recorders (2)

c. video sensor housings (2)

d. electronics units (2)

e. video relay controller

f. recorder logic relay

291. **Television Camera.** The television camera mounts on the HUD.

292. **Video Recorders .** On F/A-18C, the video recorders are located on the shock mounted rack in

the upper equipment bay . On F/A-18D, the video recorders are located on the aft dorsal deck behind the aft ejection seat.

293. Audio. Both recorders record the audio from the pilot. Audio is provided to the recorder by the intercommunications and audio system. The audio input to the recorders is interrupted during secure speech operation.

294. Video. Color video to the recorders is provided by the interface controllers. Color video in television scan format is supplied by the HUD television camera. A video sensor head provides left and right digital display indicator (DDI) area video to its respective interface controller mounted on each side of the canopy rail. The video select switch controls relays in the video relay controller that provides either left DDI or HUD video to recorder number one. The mode select switch in the cockpit provides selection of video to recorder number one in the auto or manual modes of operation.

295. Right DDI area video is sent to recorder number two. The mode select switch selects either auto or manual mode. In auto mode the operation

of the recorders is controlled by the mission computer. In manual mode the recorders are turned on and remain on. Sources for video are the left and right DDI areas via the left and right electronic units, and the HUD television camera video output. Recorder number one records HUD video or the left electronic unit video output. Recorder number two records the right electronic unit video output.

297. When the CVRS is turned on a RCDR on light on the RH advisory and threat warning indicator panel comes on. The light provides a visual indication that the recording system is operating.

298. STRIKE CAMERA SYSTEM.

299. The strike camera system is part of the Laser Detector-Tracker-Strike Camera Set AN/ASQ-173 (LDT/SCAM). The system controls the Strike Recording Still Picture Camera KB-35A. The camera provides high resolution photographic documentation of air-to-ground weapon delivery before, during, and after weapon impact. The camera is a 35mm panoramic type with a 180° forward/aft scan coverage and a 34° cross-track field of view. The camera provides an end of film signal to the mission computer system when the film supply is exhausted.

300. LASER DETECTOR TRACKER SYSTEM.

301. The Laser Detector Tracker (LDT) system detects and automatically tracks coded laser energy reflected from illuminated ground targets. The LDT system is used to deliver laser guided weapons.

302. The LDT system components are in a pod installed at weapon station 6. System components share the pod with the strike camera system.

303. System components are as listed below:

a. Mounting Adapter MT-6082/ASQ-173.

b. Interconnecting Box J-3656/ASQ-173.

c. Laser Detector DT-612/ASQ-173.

304. The mounting adapter provides mechanical and electrical interface between the Laser Detector Tracker/Striker Camera Set AN/ASQ-173 (LDT/SCAM) and the aircraft.

305. The interconnecting box is the center component of the LDT/SCAM pod. The interconnecting box has a microprocessor that controls interface between the mission computer system and the laser detector.

306. The laser detector is the forward component of the LDT/SCAM pod. The detector has a two gimbal mounted laser receiver. Power supplies and control circuits in the laser detector provide the input/outputs of the interconnecting box to control the gimbals and receiver.

307. TACTICAL ELECTRONIC WARFARE SYSTEMS.

308. The tactical electronic warfare system (TEWS) is made up of the Interference Blanker, Countermeasures Dispensing System, Countermeasures Set and Countermeasures Warning and Control System.

309. **INTERFERENCE BLANKER.** The interference blanker interfaces onboard rf transmitters and receivers that share common parts of the radio frequency spectrum. The blanker receives pulses from the transmitters and produces blanking pulses for the applicable receivers to prevent interference from the transmitted rf. During EMCON conditions it inhibits the altimeter transmitter. On 161702 AND UP, it also provides additional circuitry used to aid the countermeasures warning and control system in processing data.

310. **AN/ALE-39 COUNTERMEASURES DISPENSING SYSTEM - 161702 THRU 164980.** The system provides protection for the aircraft against enemy radars and missiles by ejecting chaff, flares, or jammer payloads. The chaff, flares, and jammers are contained in two dispenser housings, one on each side of the aircraft. The system contains a programmer which allows operator control of type and mode of payload ejected.

311. **AN/ALE-47 COUNTERMEASURES DISPENSING SYSTEM - 165171 AND UP.** The AN/ALE-47 Countermeasures Dispensing System provides the capability of automatic or pilot commanded response for dispensing chaff, flares, and two other categories of expendables. The AN/ALE-47 works in conjunction with other countermeasures systems to defeat air interceptor (AI), anti-aircraft artillery (AAA), and surface-to-air missiles (SAMS).

312. **COUNTERMEASURES SET.** The system detects and deceives enemy pulse fire control and

guidance radars. When threat signals are received, the countermeasures set detects, processes and transmits deception signals. The deception signals prevent fire control and guidance radars from acquiring correct information on the aircraft. On 161702 AND UP, the countermeasures set exchanges information with the countermeasures warning and control system.

313. The countermeasures set has three (3) operating modes: standby, receive and transmit. Indications of operational mode, aircraft illumination by enemy radar, and threat conditions are shown by indicator lights. The countermeasures set has a self-test feature to give a go or no-go indication of the set performance.

314. **COUNTERMEASURES WARNING AND CONTROL SYSTEM - 161702 AND UP.** The countermeasures warning and control system is designed to provide aural and visual alerts upon detection of threat radar signals and at the same time provide information to the HARM missile and countermeasures set. The system will detect multiple threat signals and provide a relative bearing to each signal source. When a threat is detected, the system visually indicates the signal source with a coded symbol displayed on the azimuth indicator. The position of the coded symbol on the azimuth indicator indicates relative bearing and lethality. With mission computer system digital data computer no. 1 CONFIG/IDENT NO. 84A AND UP loaded, the coded symbols are also displayed on the HUD.

315. GLOBAL POSITIONING SYSTEM - 164945 AND UP, ALSO 163427 THRU 164912 AFTER F/A-18 AFC-175 PART 2.

315A. The global positioning system (GPS) is a space based, radio navigation system that provides continuous, all weather, passive operation to an unlimited number of users anywhere on the earth. The GPS is made up of a receiver/processor and a GPS antenna. The receiver processor receives, through the antenna, modulated navigation signals from GPS satellites. Satellite position data is used by the GPS receiver/processor to determine aircraft position and velocity. Satellite time data is also available from the GPS receiver/processor.

316. FORWARD LOOKING INFRARED SYSTEM.

317. The forward looking infrared (FLIR) system provides thermal imagery, in television format, for detection and identification of tactical targets. It is able to automatically track selected targets and provide accurate target line-of-sight pointing angles and rates to the mission computer system.

318. WITH DETECTING SET PN 260255 AND 260579, the Laser Target Designator/Ranger (LTD/R) is a subsystem of the FLIR system and is inoperable when the FLIR system is inoperable. The LTD/R provides target range information and illuminates targets with laser energy for guidance of laser guided weapons.

319. WITH DETECTING SET PN 260579, the Laser Spot Tracker (LST) is a subsystem of the FLIR system and is inoperable when the FLIR system is inoperable. The LST provides passive laser target detecting information when targets are illuminated with laser energy for guidance of laser guided weapons.

320. The FLIR pod is installed on the left fuselage at weapon station 4. The FLIR pod (FLIR/LTD/R/LST) components are:

a. Optics-Stabilizer.

b. Pod Forward Section.

c. WITH DETECTING SET PN 260255 AND 260579, Laser Transceiver.

d. WITH DETECTING SET PN 260255 AND 260579, Laser Transceiver Surrogate.

e. Infrared Receiver.

f. Pod Aft Section.

g. Power Supply.

h. Controller-Processor.

i. Servo Controller.

j. Roll Drive Amplifier.

k. Roll Drive Motor.

l. Temperature Control.

m. WITH DETECTING SET PN 260255 AND 260579, Laser Power Supply.

n. WITH DETECTING SET PN 260255 AND 260579, Laser Power Supply Surrogate.

321. **OPTICS-STABILIZER.** The optics-stabilizer contains a pitch and yaw stabilized sight assembly. The stabilized sight assembly receives the infrared radiation that passes through the infrared window and optically transfers the radiation to the infrared receiver.

322. WITH DETECTING SET PN 260255 AND 260579, the optics-stabilizer contains laser optics and laser window. Laser radiation, from the LTD/R subsystem laser transceiver, passes through the laser optics and laser window. Received laser radiation passes through the laser window and laser optics to the laser transceiver.

323. WITH DETECTING SET PN 260579, the Laser Spot Tracker (LST) subsystem (LST receiver, LST flip mirror and LST receiver power supply) is contained in the optics-stabilizer. The LST subsystem shares a common laser optical path with the LTD/R subsystem from the laser window to the LST flip mirror.

324. **POD FORWARD SECTION.** The pod forward section is the support frame for the optics-stabilizer and infrared receiver. The pod forward section contains the mechanical interface with the pod aft section, a mounting structure for all optical assembly components, an optical system to relay the infrared radiation from the optics-stabilizer to the infrared receiver, an interface for the optics-stabilizer and a mechanism to drive the windscreen about the pitch axis of the pod. WITH DETECTING SET PN 260255 AND 260579, the pod forward section contains and provides a mounting surface for the laser transceiver or laser transceiver surrogate. The pod forward section provides alignment for the laser relay assembly and the laser transceiver.

325. **WITH DETECTING SET PN 260255 AND 260579, LASER TRANSCEIVER.** The laser transceiver communicates with the laser power supply and generates the laser beam. The laser transceiver also monitors laser energy, detects reflected energy and provides reference range.

326. **WITH DETECTING SET PN 260255 AND 260579, LASER TRANSCEIVER SURROGATE.** The laser transceiver surrogate allows the LTD/R to operate as a FLIR when the laser transceiver is removed. The laser transceiver properly directs cooling air when the laser transceiver is removed.

327. **INFRARED RECEIVER.** The receivers converts the infrared radiation from the optics-stabilizer into a television compatible electronic signal. Derotation of the scene is provided by a servo which rotates many of the receiver assembly components about the optical axis.

328. **POD AFT SECTION.** The pod aft section is the main structure support for the below listed components of the FLIR pod:

a. Controller Processor.

b. Servo Controller.

c. Roll Drive Amplifier.

d. Roll Drive Motor.

e. Temperature Control.

f. WITH DETECTING SET PN 260255 AND 260579, Laser Power Supply.

g. WITH DETECTING SET PN 260255 AND 260579, Laser Power Supply Surrogate.

329. The pod aft section is bolted to the aircraft at four attach points to provide a structural interface. Electrical interface is provided by three connectors of the pod aft section that connect to aircraft disconnects. Cooling air and bleed air interface with the aircraft environmental control system is also provided by the pod aft section.

330. **POWER SUPPLY.** The power supply provides power to all electronic components of the FLIR pod with the exception of the temperature control.

331. **CONTROLLER-PROCESSOR.** The controller-processor provides the interface between the mission computer system and the FLIR pod components. Data processing, timing, and control between components of the pod are controlled by the controller-processor for operational and testing functions.

332. **SERVO CONTROLLER.** The servo controller provides an interface between the controller-processor and the optics stabilizer.

333. **ROLL DRIVE AMPLIFIER.** The roll drive amplifier provides electrical power to the roll drive motor.

334. **ROLL DRIVE MOTOR.** The roll drive motor rotates the pod head section with respect to the pod aft section.

335. **TEMPERATURE CONTROL.** The temperature controller processes inputs from the controller-processor and servo controller to control FLIR pod temperature.

336. **WITH DETECTING SET PN 260255 AND 260579, LASER POWER SUPPLY.** The laser power supply provides the communication interface with the controller-processor, runs self test, generates LTD/R commands and converts aircraft power into low voltage power for the LTD/R subsystem.

337. **WITH DETECTING SET PN 260255 AND 260579, LASER POWER SUPPLY SURROGATE.** The laser power supply surrogate provides the interface for the standby command when the laser power supply is removed. This allows the LTD/R to operate as a FLIR when the laser power supply is removed.

338. NAVIGATION INFRARED RECEIVING SET- 163985 AND UP.

339. The Navigation Infrared Receiving Set AN/AAR-50 (NFLR) provides real-time passive thermal imagery in television format for display in the cockpit. This provides the capability to navigate and maneuver the aircraft, detect and identify targets under day, night or adverse weather conditions.

340. The NFLR components are in a pod installed on the right fuselage at weapon station six. The NFLR pod is installed or removed to be compatible with aircraft mission requirements. NFLR components are:

a. Infrared Receiver-Converter R-2352/AAR-50

b. Digital Computer-Converter CP-1805/AAR-50

c. Thermal-Control HD-1158/AAR-50

d. Mounting-Adapter MT-6512/AAR-50

341. **INFRARED RECEIVER-CONVERTER R-2352/AAR-50.** The infrared receiver-converter is the forward section of the NFLR pod. It contains a high resolution, fixed position, forward looking infrared (FLIR) sensor. The FLIR sensor detects infrared (thermal) radiation emitted by objects within its field of view.

342. **DIGITAL COMPUTER-CONVERTER CP-1805/AAR-50.** The digital computer-converter is the center section of the NFLR pod. It communicates with the mission computer system by way of an avionic mux channel to provide control of all NFLR system functions.

343. **THERMAL-CONTROL HD-1158/AAR-50.** The thermal-control is the aft section of the NFLR pod. It contains the electrical and mechanical assemblies required to maintain the NFLR at normal operating temperatures.

344. **MOUNTING-ADAPTER MT-6512/AAR-50.** The mounting-adapter provides mechanical and electrical interface between the NFLR pod and the aircraft.

345. EMBEDDED GPS/INS (EGI) - 161925 THRU 163175 AFTER F/A-18 AFC-231.

346. The EGI system is a self-contained system made up of an inertial navigation system (INS) and an embedded global positioning system (GPS). The EGI provides information for other aircraft systems to support navigation, time distribution, weapons delivery, radar, and flight control. Navigation and attitude information provided includes acceleration, velocity, position, true and magnetic heading, digital and analog attitude (pitch, roll, and heading), attitude rates, and time data.

347. The EGI is made up of an EGI receiver, antenna, and data fill connector, indicator, and switch. The INS and GPS are contained in the EGI receiver.

348. **EGI RECEIVER.** The EGI receiver is a self-contained unit made up of an inertial navigation system (INS) and an embedded GPS receiver (EGR). It provides inertial data at all latitudes and longitudes, while providing position, velocity and time (PVT) information to the aircraft interfaces. When installed, the EGI receiver is hard mounted on the electrical equipment mounting base and cooled by the avionics cooling system.

349. **Inertial Navigation System.** The INS contains the inertial sensor assembly (ISA) and software.

The ISA is an all attitude self-contained strapdown unit which contains three zero-lock laser gyros that measure vehicle angular rates (attitude). It also contains a three-axis accelerometer that measures vehicle linear acceleration (velocity). These sensed angular rates and linear accelerations are processed by the software to derive aircraft attitude, velocity, and position data.

350. **Embedded GPS Receiver.** The embedded GPS receiver (EGR) receives, tracks, and processes the GPS signal from the antenna and provides position, velocity, and time (PVT) information to aircraft interfaces. The EGR can operate either as a stand alone (unaided) unit or with velocity aiding data from the ISA for integration into the GPS solution. The EGR supplies information to the INS in support of navigation, time distribution, and weapons delivery. Information provided by the GPS has satellite position and velocity, range and range rate to the satellite, and stand-alone GPS operation.

351. The EGI receiver has two C-size lithium batteries which maintain GPS keying data when power is removed from the system. The batteries are connected in parallel so that replacing one at a time makes sure no data is lost.

352. The antenna is a fixed reception pattern dome antenna and receives the RF navigation signals.

353. Crypto keys are loaded through the data fill connector. The data fill LED indicator comes on when crypto keys are satisfactorily loaded. The data fill switch is used to load crypto keys into and remove crypto keys from the EGI receiver.

ORGANIZATIONAL MAINTENANCE

DANGER AREAS AND PRECAUTIONARY MEASURES

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 126	1 Oct 94	Addition of (DFIRS) Deployable Flight Incident Recorder Set (ECP 321R1C1)	1 Dec 92	-
ACC 446 REV A	9 Jan 85	Parachute Harness Sensing Release Unit; Installation of (ECP CHINA LAKE-93)	1 Dec 86	-
F/A-18 AFC 236	-	Retrofit of Combined Interrogator/ Transponder (CIT) Identification Friend or Foe (IFF) System (ECP MDA-F/A-18-00520R1)	15 Mar 00	ECP Coverage Only

Record of Applicable Technical Directives (Continued)

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A+ Avionics Upgrade, Installation of	1 Oct 00	ECP Coverage Only

1. FLAMMABLE LIQUIDS, COMPRESSED GASES, AND EXPLOSIVE DEVICES.

2. Areas including reservoirs of flammable liquids, gases under pressure, and explosive devices are shown (figure 1). Rescue and maintenance personnel should be aware of the hazards related to these areas.

3. CANOPY, SEAT AND DFIRS EXPLOSIVE DEVICES.

4. Many explosive devices (figure 2) are located in and around the crew station. The ejection seat(s) have rocket motors, initiators, and controls that require special handling during ground operations. The canopy has rocket motors, initiators, thrusters, and controls that also require special handling. Safety procedures are covered in A1-F18AC-PCM-000.

5. On 164725 AND UP; ALSO 164627 THRU 164724 AFTER F/A-18 AFC 126, the DFIRS impact initiator, underwater initiator and the severable door (63L) are explosive devices. They do not require special handling during ground operations.

6. AIRFRAME AND EXTERNAL STORES.

7. External fuel tanks, vertical ejection racks, missile launchers and conventional/nuclear weapons (figure 3), loaded on wing or fuselage centerline pylons may be ejected by explosive cartridges. The area near these devices must be considered hazardous for maintenance personnel when aircraft electrical power is on.

8. Missile exhaust areas and path of trajectory are hazardous for personnel. An inadvertently fired missile can cause death or injury from either end.

9. The M61A1 or M61A2 gun projectile trajectory path is hazardous to personnel. Gun fire can cause death or injury.

10. Aircraft carrying munitions must be loaded, unloaded, and parked in designated explosives parking areas.

11. ENGINE.

12. Danger areas resulting from engine operation are related to exhaust velocity and temperature, air intake, and noise.

13. **AIR INTAKE AND EXHAUST.** (figure 4). During ground operation of the engines, the forward and aft ends of the aircraft are danger areas. Inrushing air can pull a person into or against the intake ducts. Engine exhaust air can cause death or serious burns. The area immediately aft of the tail pipes is hazardous for 15 minutes after engine shutdown.

14. **ENGINE NOISE HAZARD.** The noise level of operating jet engines can cause hearing loss. Figure 5 shows relative noise levels at various distances from aircraft. Ear protectors must be worn when working near operating engines.

15. RADAR ANTENNA.

16. When the radome is open and the radar system is operating (figure 6). Personnel should be aware that the radar antenna can make sudden position changes and should stay 3 feet away from the antenna.

17. RADIATION.

18. Radar operation is the main source of radiation injury to personnel. All radio, countermeasures set, and radar transmitters (figure 6) are sources of rf energy. Radiation hazards are listed below:

a. Long exposure to rf energy at close range will cause personnel injury. High rf energy areas should be posted with warning signs.

b. Accidental firing of electroexplosive devices (EED) can result from rf energy radiated through

an opening in the EED, or conducted through the firing leads.

c. Radiation may cause photoflash bulbs to go off, resulting in injury to personnel.

d. Radiation may cause sparking between metal surfaces such as a fuel hose nozzle and aircraft structure. The sparks may ignite fuel vapor.

19. **PRECAUTIONARY MEASURES.** Personnel should not work in radiation fields of operating radar antennas.

20. All transmitting equipment should be turned off before bringing EED into the area.

21. Transmitters should not be operated within 500 feet of uninstalled EED.

22. Observe the rules below when handling EED:

a. All handling of EED must be done in an area free from rf energy.

b. The EED must be kept in containers until installation is possible.

c. Electrical lead shorting clips on EED must not be removed until required.

d. Electrical leads must not contact aircraft structure.

e. Unnecessary contact of electrical leads with hands must be prevented. The body of the handler may act as an antenna.

f. Rings, watches, keys, or other metallic objects must not be worn or carried in areas of rf energy.

23. Flammable or explosive materials, in or in contact with metallic containers, must not be left in rf energy fields.

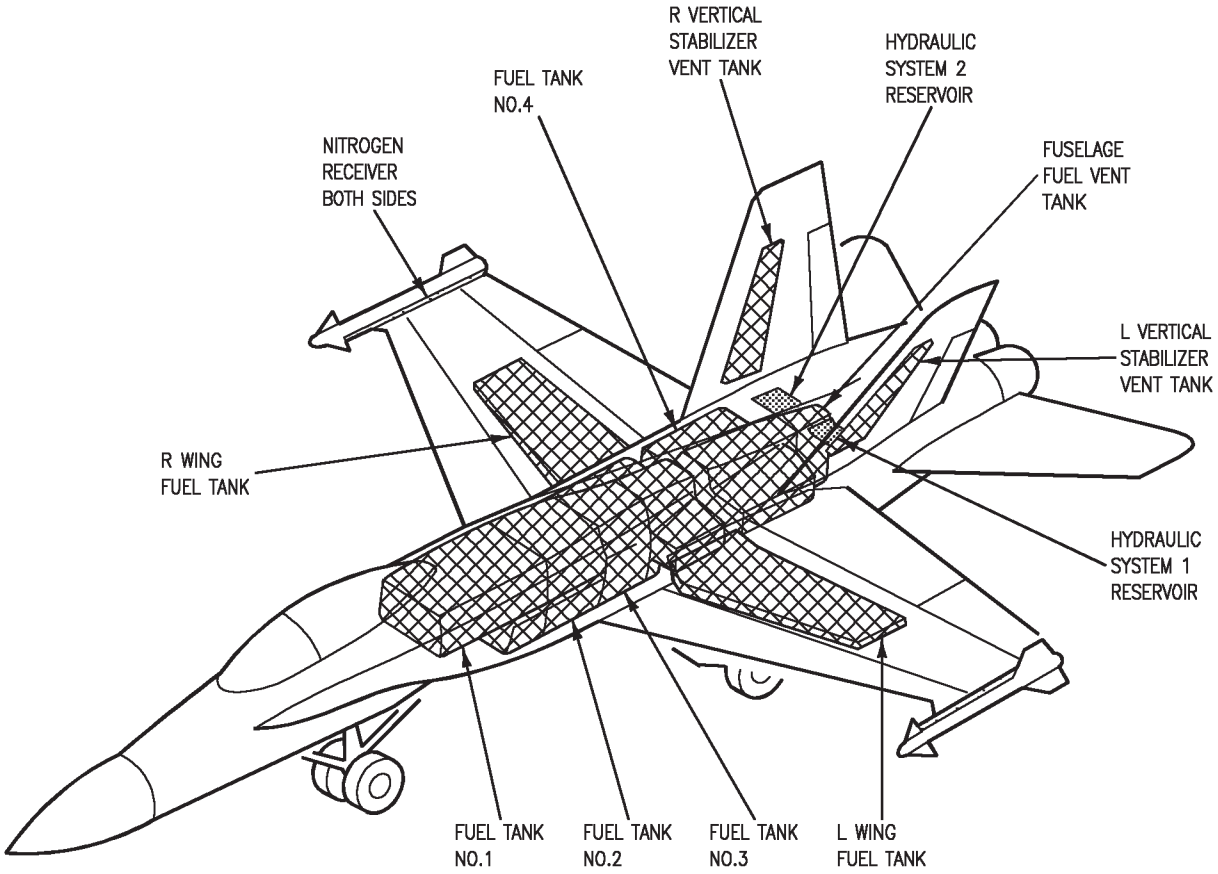
24. Refueling must not be done within 100 feet of operating airborne type radio or air radar equipment or within 300 feet of ground radar equipment.

25. **MINIMUM SAFE DISTANCES.** All distances shown (figure 6) are based on maximum power output of transmitter. Distances shown do not apply to assembled EED mounted on radiating aircraft, because they are not in the main power beam of any antenna, and are normally safe.

26. AUXILIARY POWER UNIT (APU).

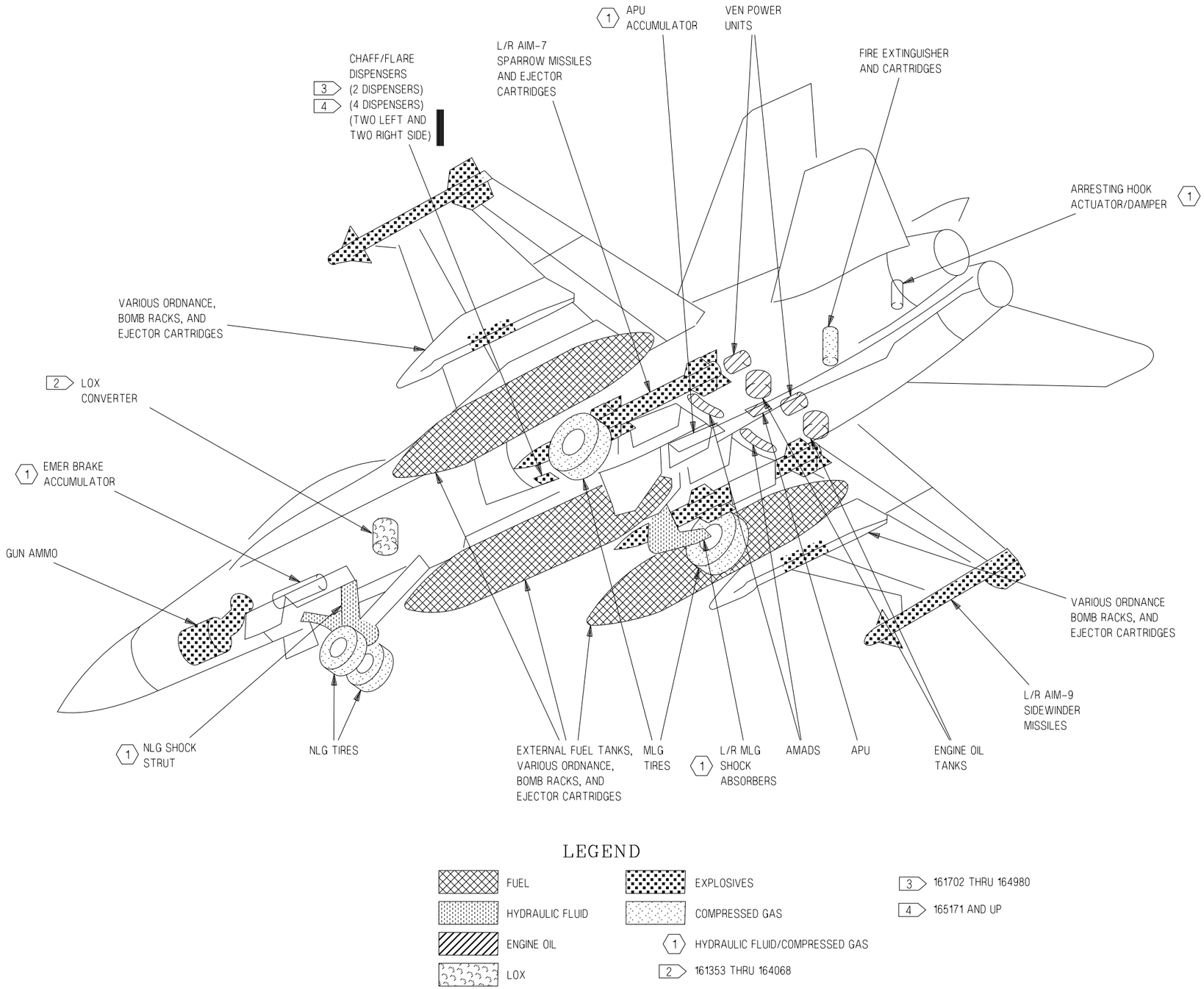
27. **AIR INTAKE AND EXHAUST.** Danger areas resulting from APU operation are shown (figure 7). The APU intake duct is in door 52. The APU exhaust duct is in door 66.

28. **NOISE HAZARD.** Noise levels near APU intake and exhaust ports during operation may cause hearing loss. Ear protection must be worn when working near an operating APU.



18AC-GAI-00-(4-1)11-CATI

Figure 1. Flammable Liquids, Compressed Gases and Explosive Devices (Sheet 1)



18AC-GAI-00_4-2-24

Figure 1.

Figure 1. Flammable Liquids, Compressed Gases and Explosive Devices (Sheet 2)

Figure 1.

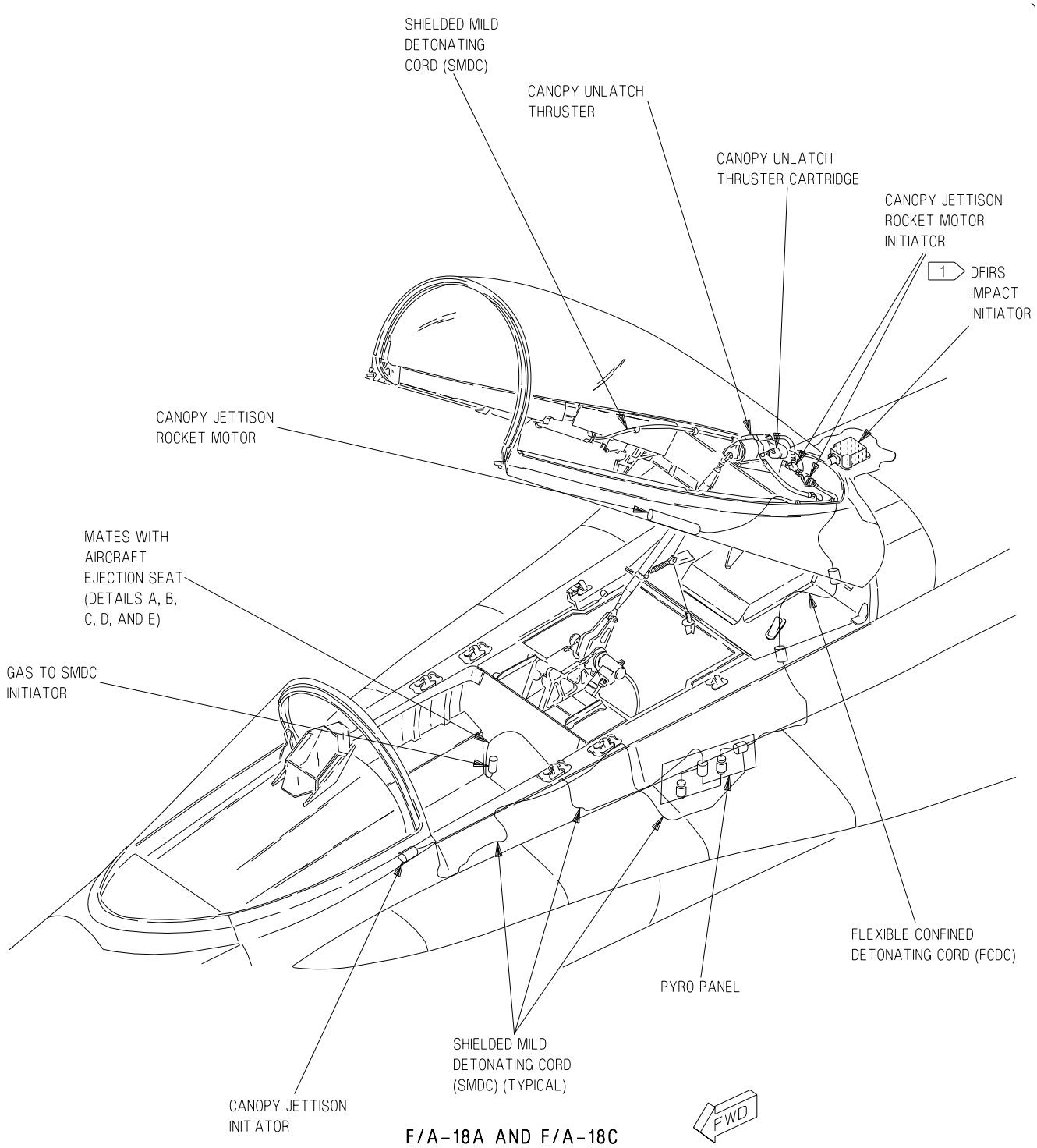
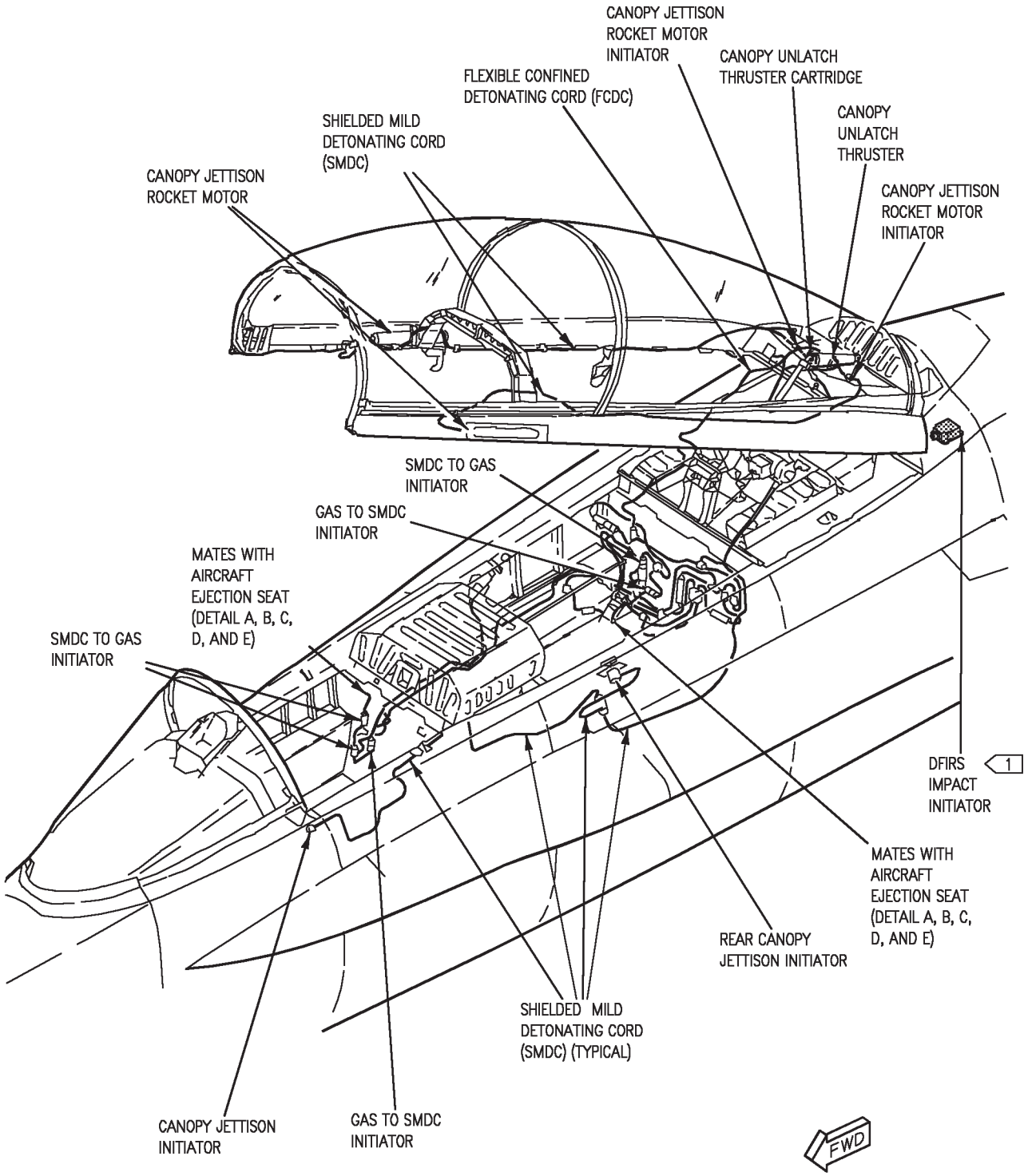


Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 1)

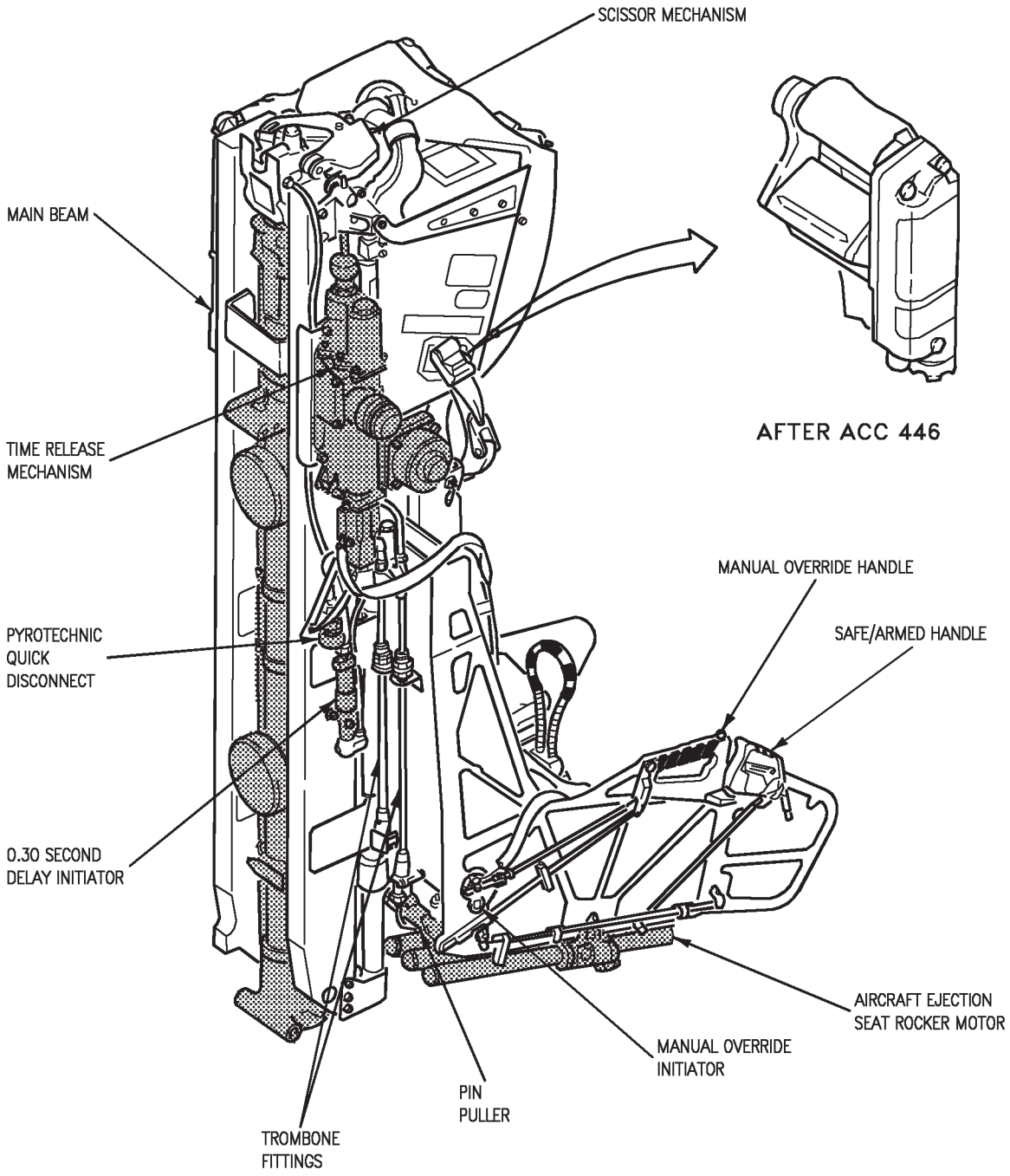


F/A-18B AND F/A-18D

(AIRCRAFT EJECTION SEAT REMOVED FOR CLARITY)

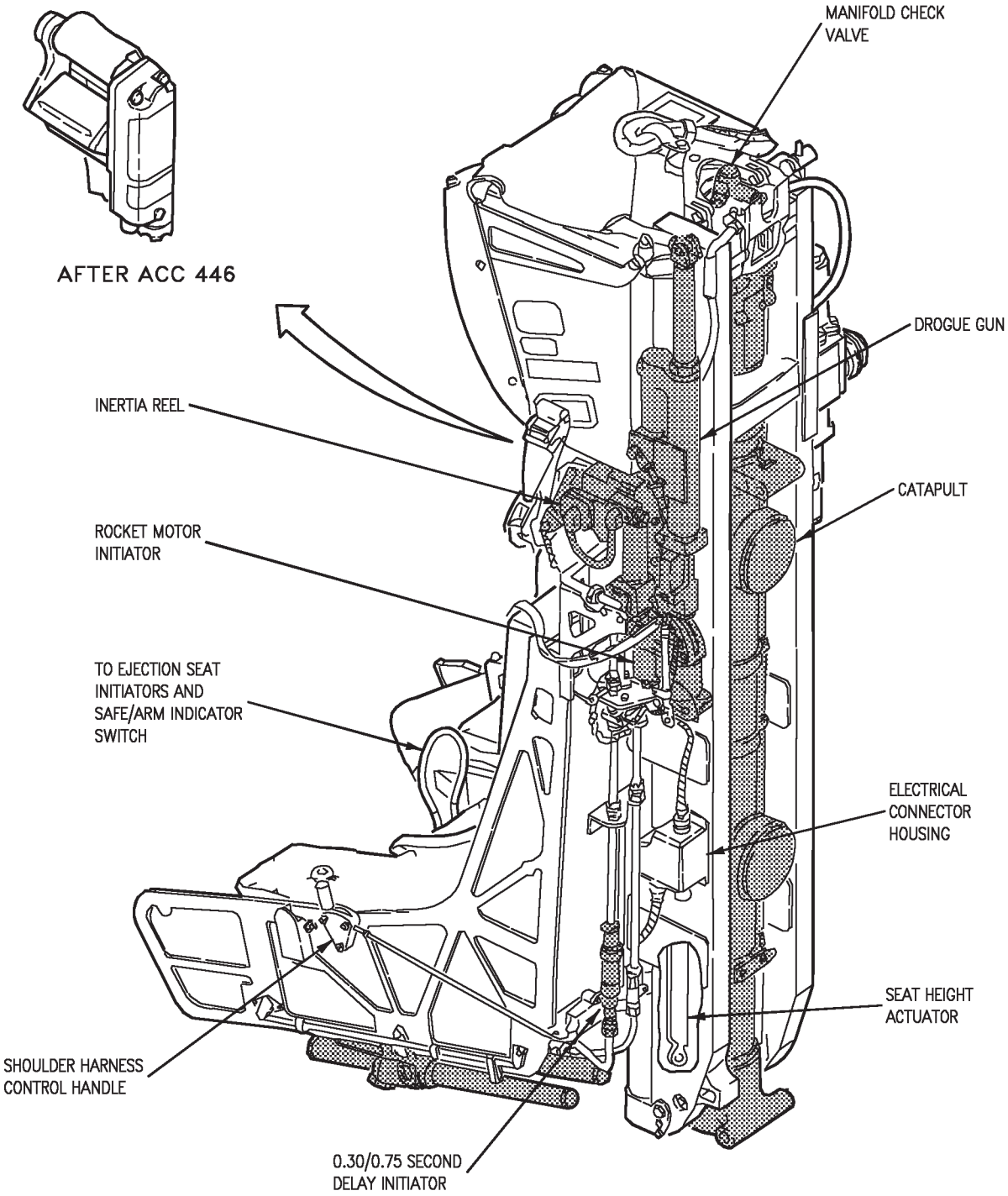
18AC-GAI-00-(14-2)18-SCAN

Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 2)



18AC-GAI-00-(14-3)15-SCAN

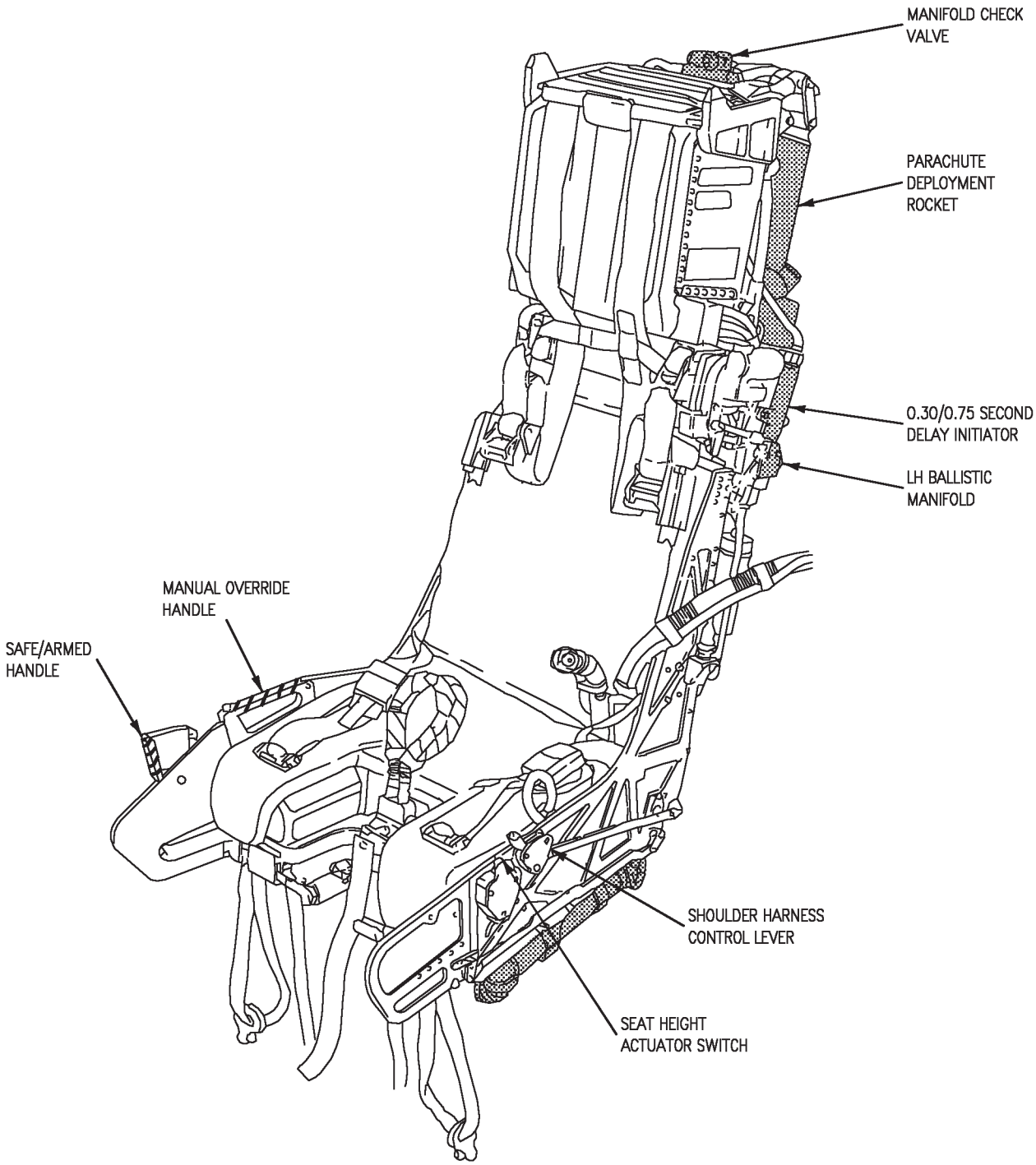
Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 3)



DETAIL B (SJU-5/A OR SJU-6/A)
F/A-18A/B
F/A-18C/D 163427 THRU 164068

18AC-GAI-00-(14-4)15-SCAN

Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 4)

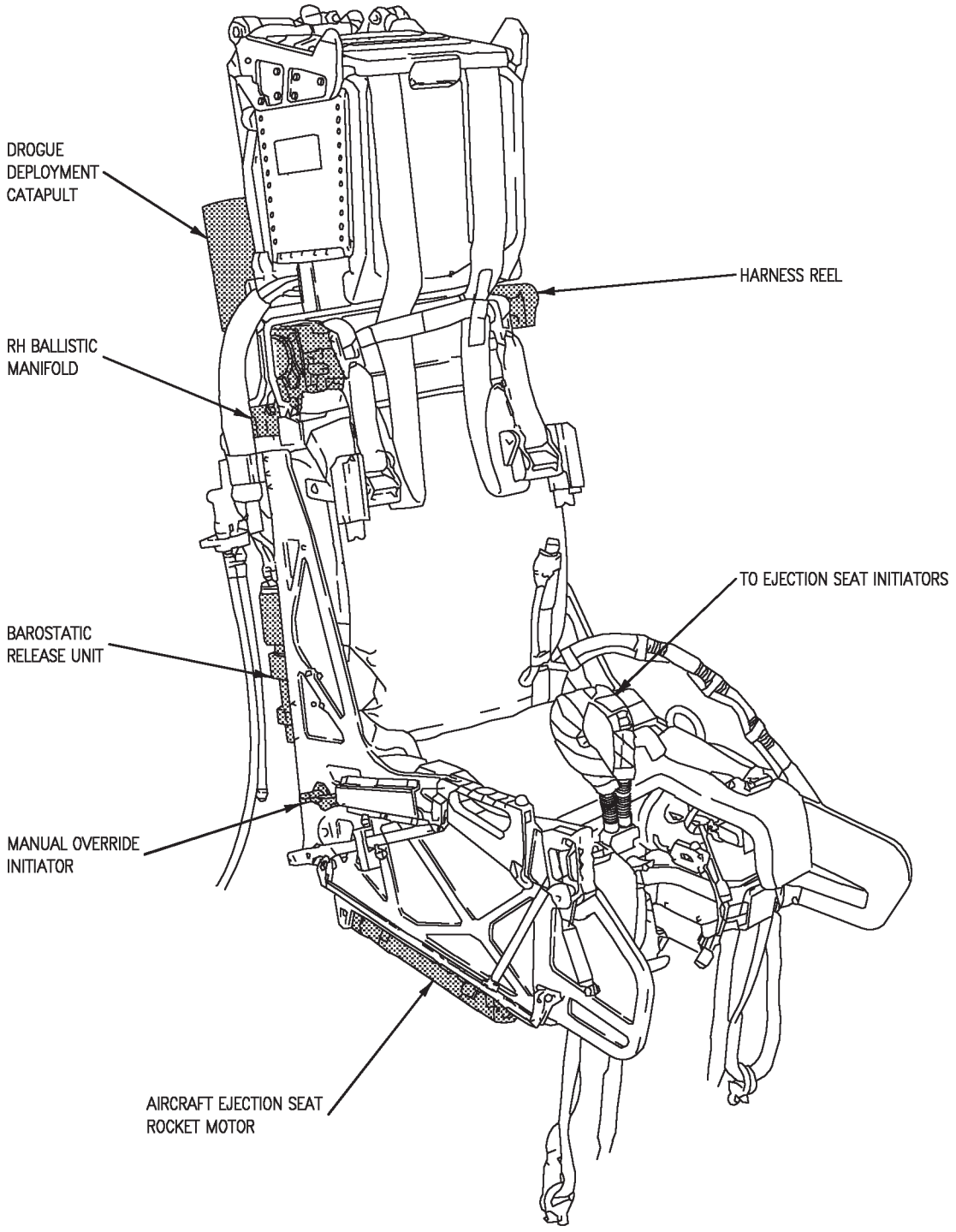


DETAIL C (SJU-17(V)1/A OR SJU-17(V)2/A)

F/A-18C/D 164196 AND UP

18AC-GAI-00-(14-5)15-SCAN

Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 5)

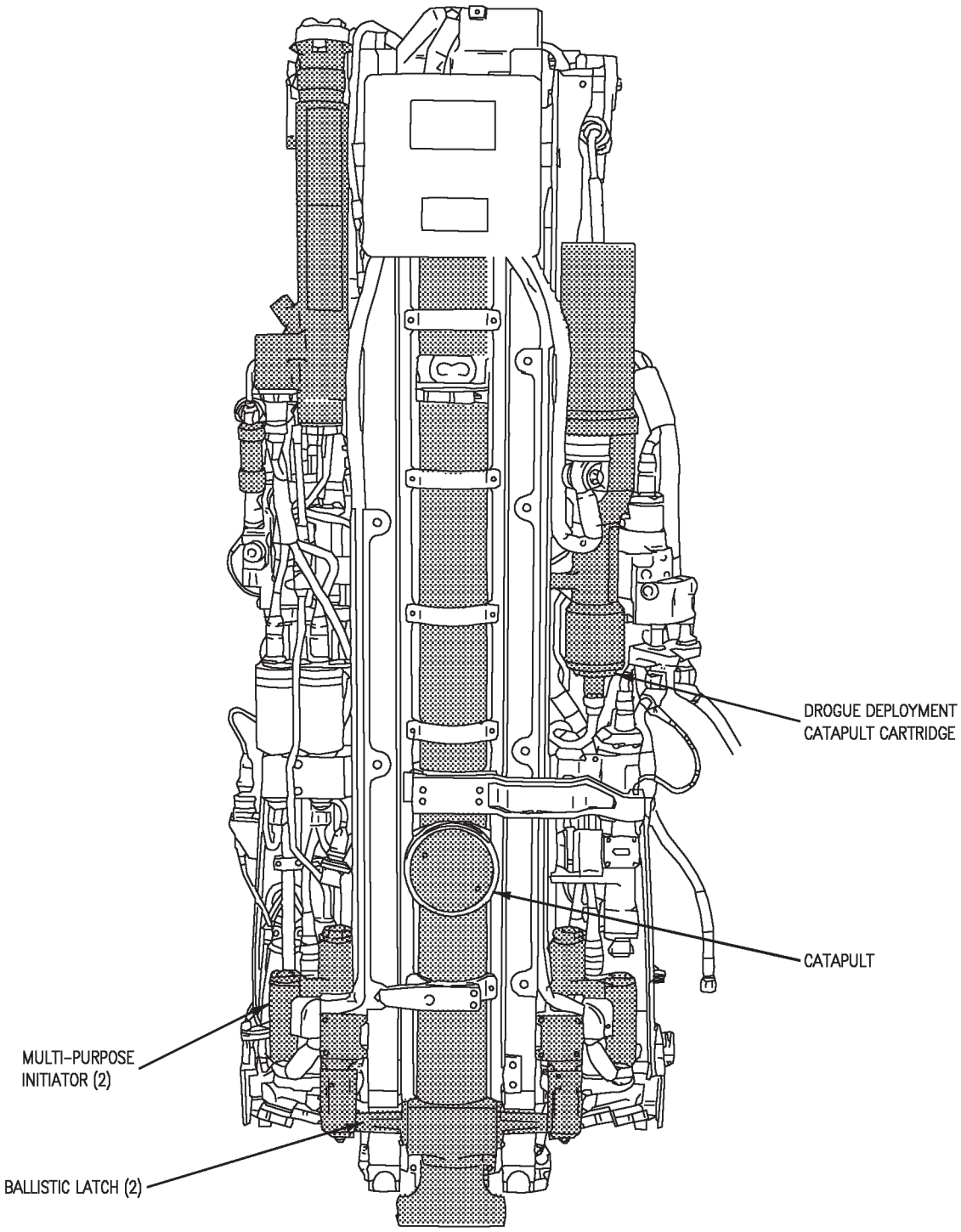


DETAIL D (SJU/17(V)1/A OR SJU-17(V)2/A)

F/A-18C/D 164196 AND UP

18AC-GAI-00-(14-6)15-SCAN

Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 6)



DETAIL E (SJU/17(V)1/A OR SJU-17(V)2/A)
F/A-18C/D 164196 AND UP

18AC-GAI-00-(14-7)15-SCAN

Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 7)

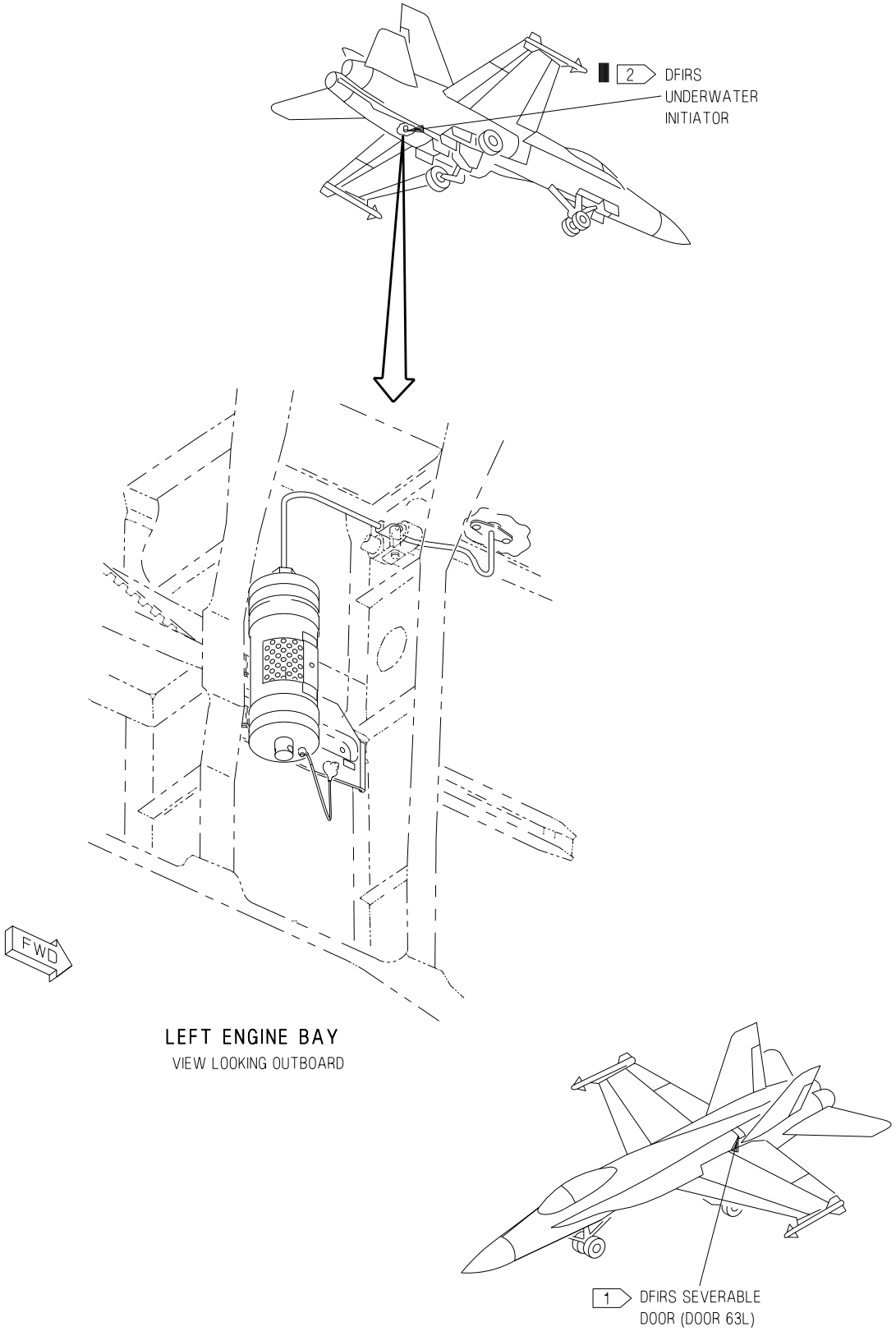
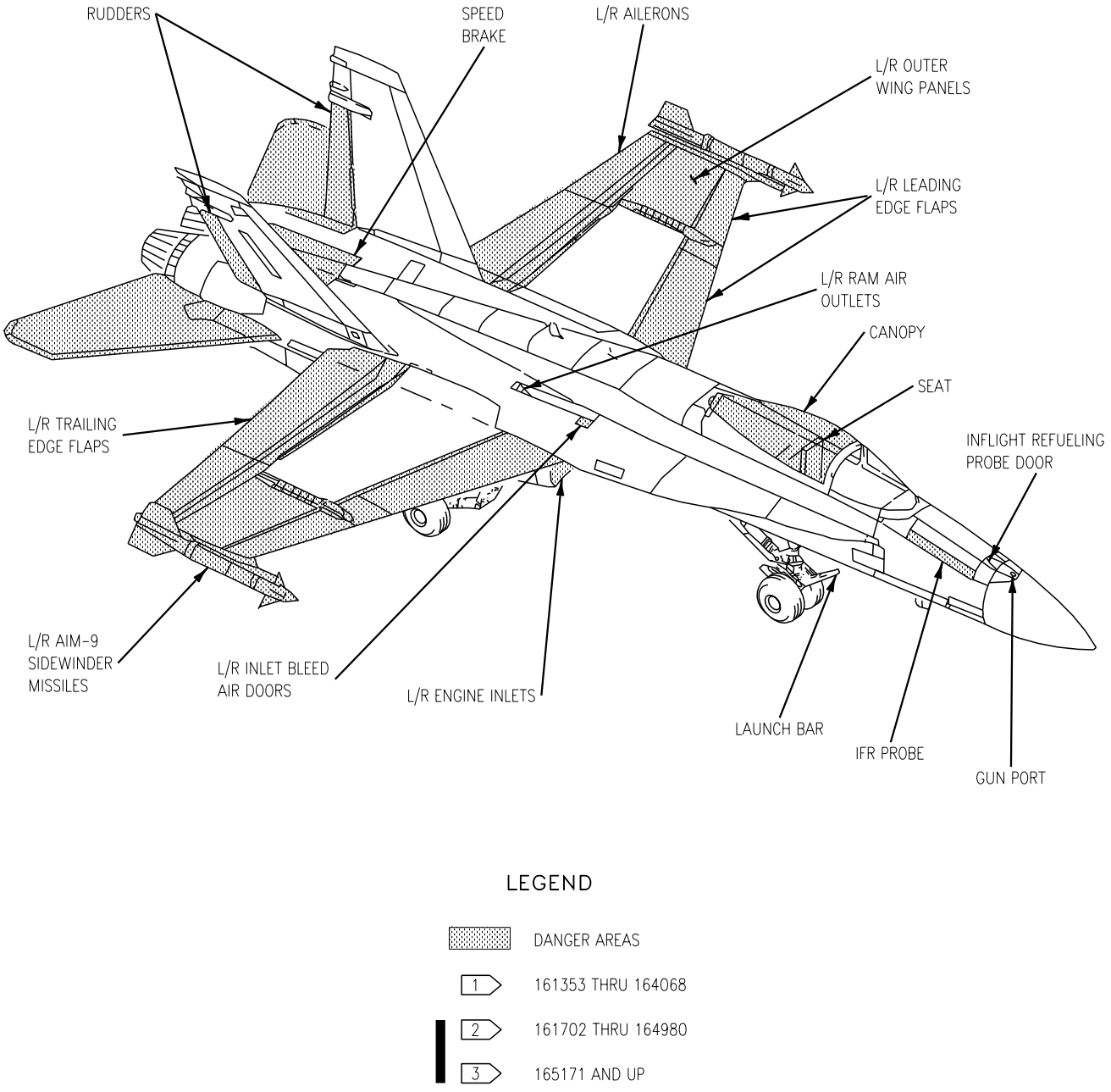


Figure 2. Canopy, Seat and DFIRS Explosive Devices (Sheet 8)



18AC-GAI-00-(3-1)23-CATI

Figure 3. Airframe and External Stores Danger Areas (Sheet 1)

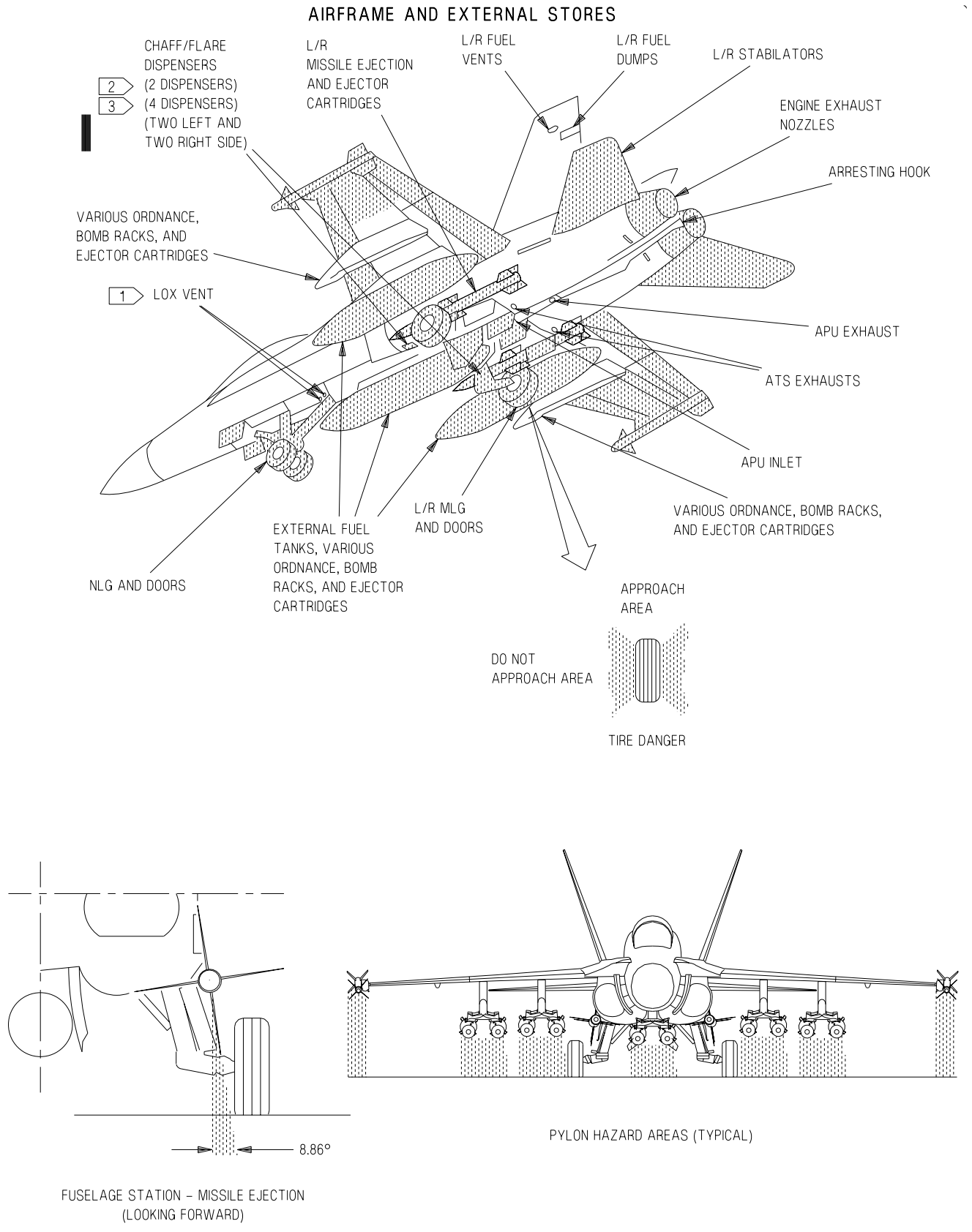
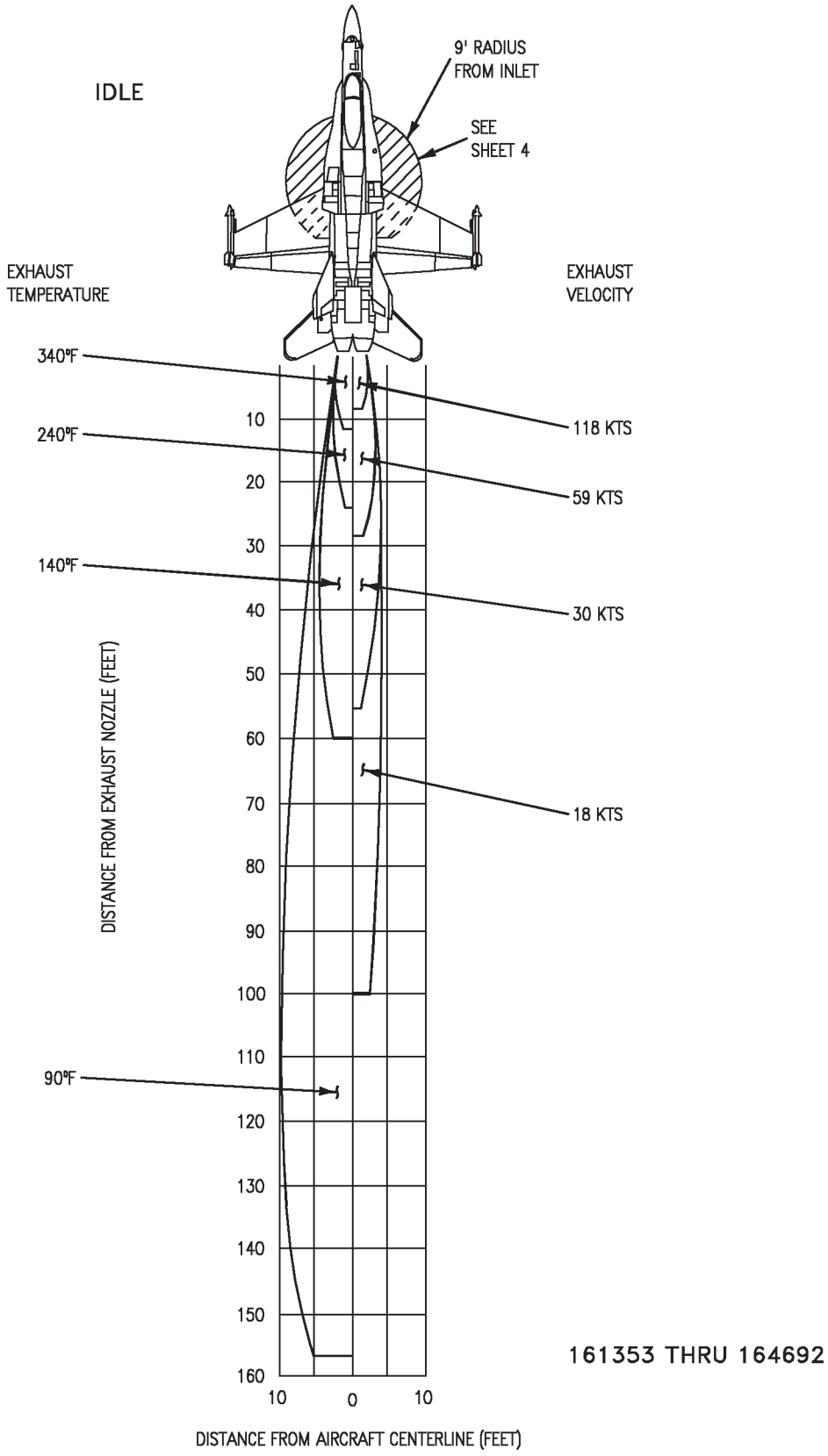


Figure 3. Airframe and External Stores Danger Areas (Sheet 2)



18AC-GAI-00-(11-1)17-SCAN

Figure 4. Engine Danger Areas (Sheet 1)

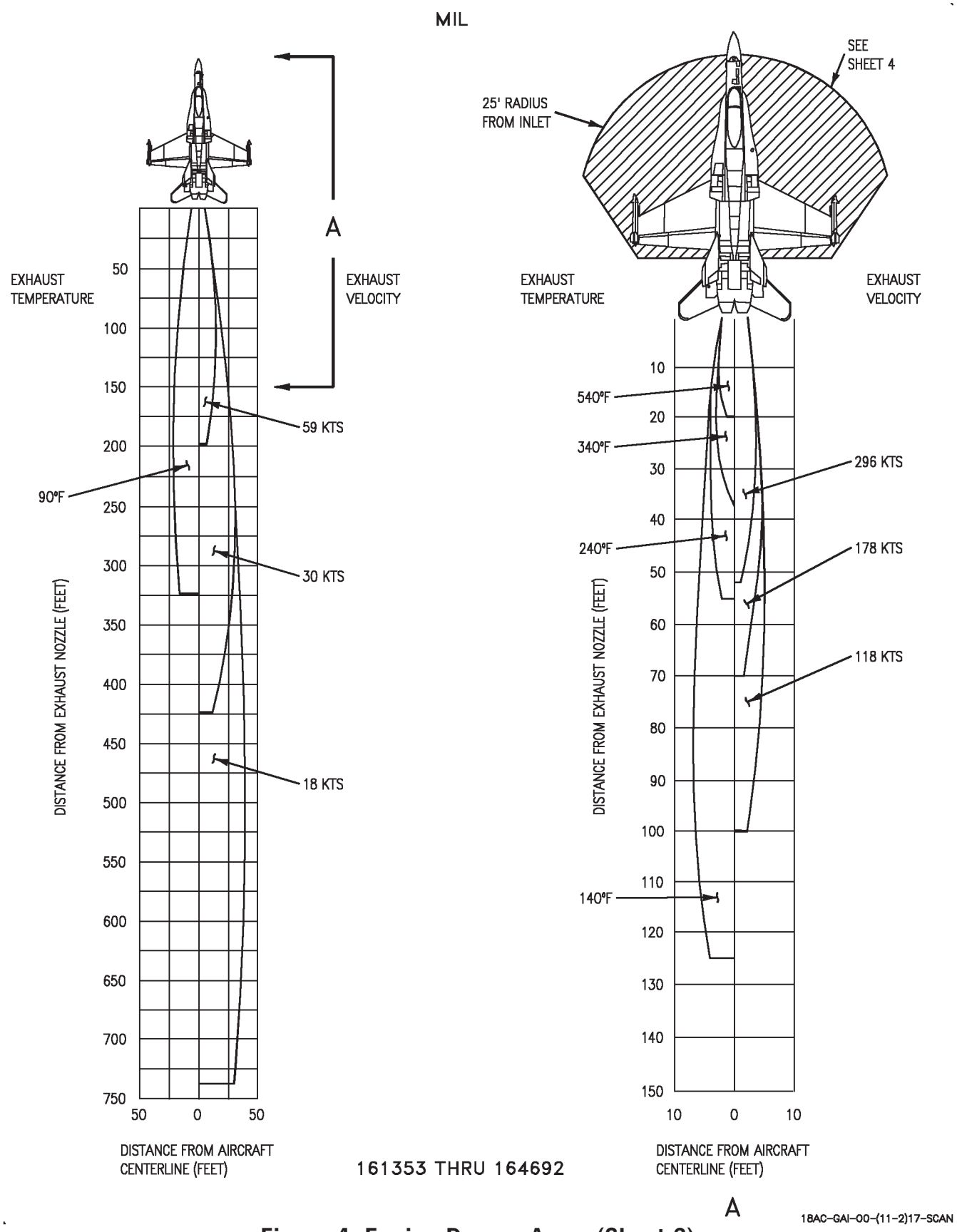


Figure 4. Engine Danger Areas (Sheet 2)

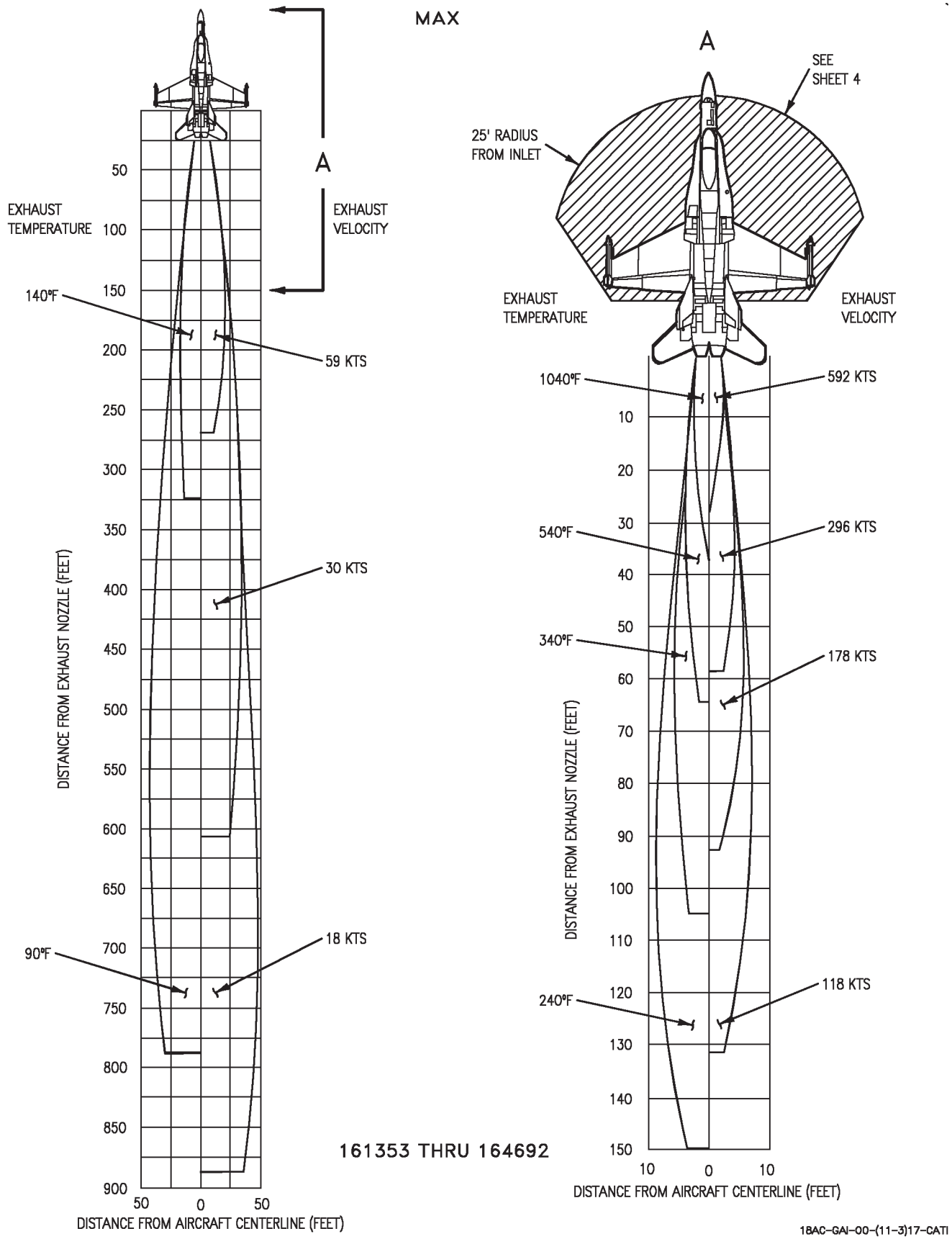
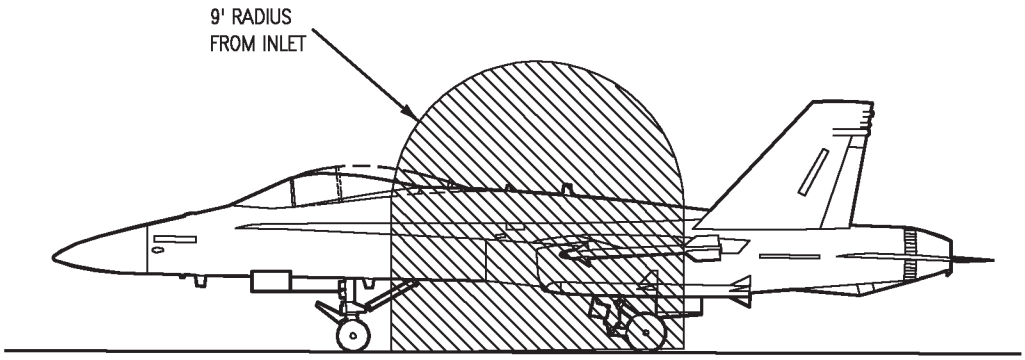


Figure 4. Engine Danger Areas (Sheet 3)

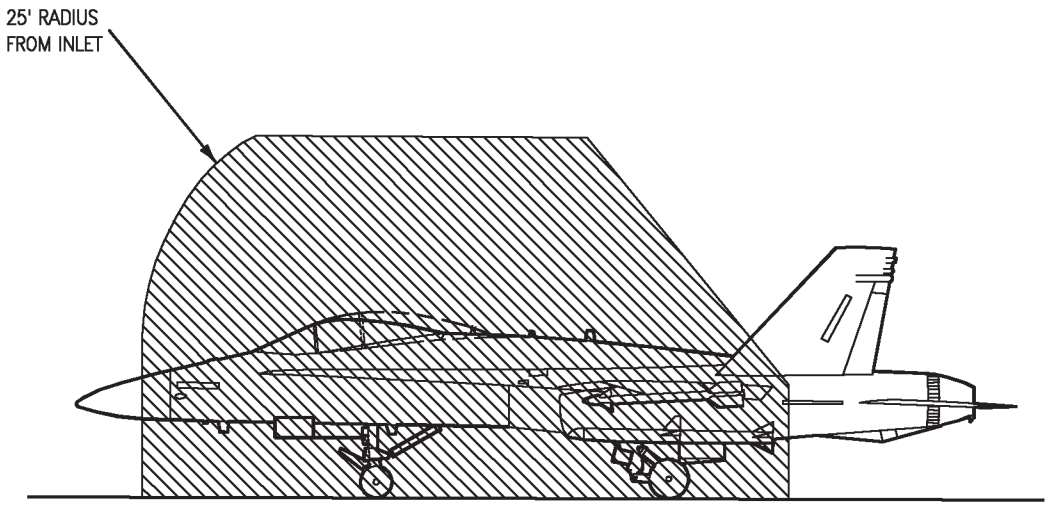
WARNING

- To prevent personnel ingestion when engine ground runup screens are not installed or personnel penetration when engine ground run up screens(s) are installed, do not enter area within 9 foot radius of engine inlets while engines are at IDLE or 25 foot radius of engine inlets while engines are at MIL or MAX power.

- When maintenance instructions require going near engine air inlets, approach from the rear with engines operating, remaining as far to the rear as possible. Use caution to prevent loose objects from being ingested by the engines.



INLET DANGER AREA IDLE



INLET DANGER AREA MIL AND MAX

Figure 4. Engine Danger Areas (Sheet 4)

18AC-GAI-00-(11-4)17-SCAN

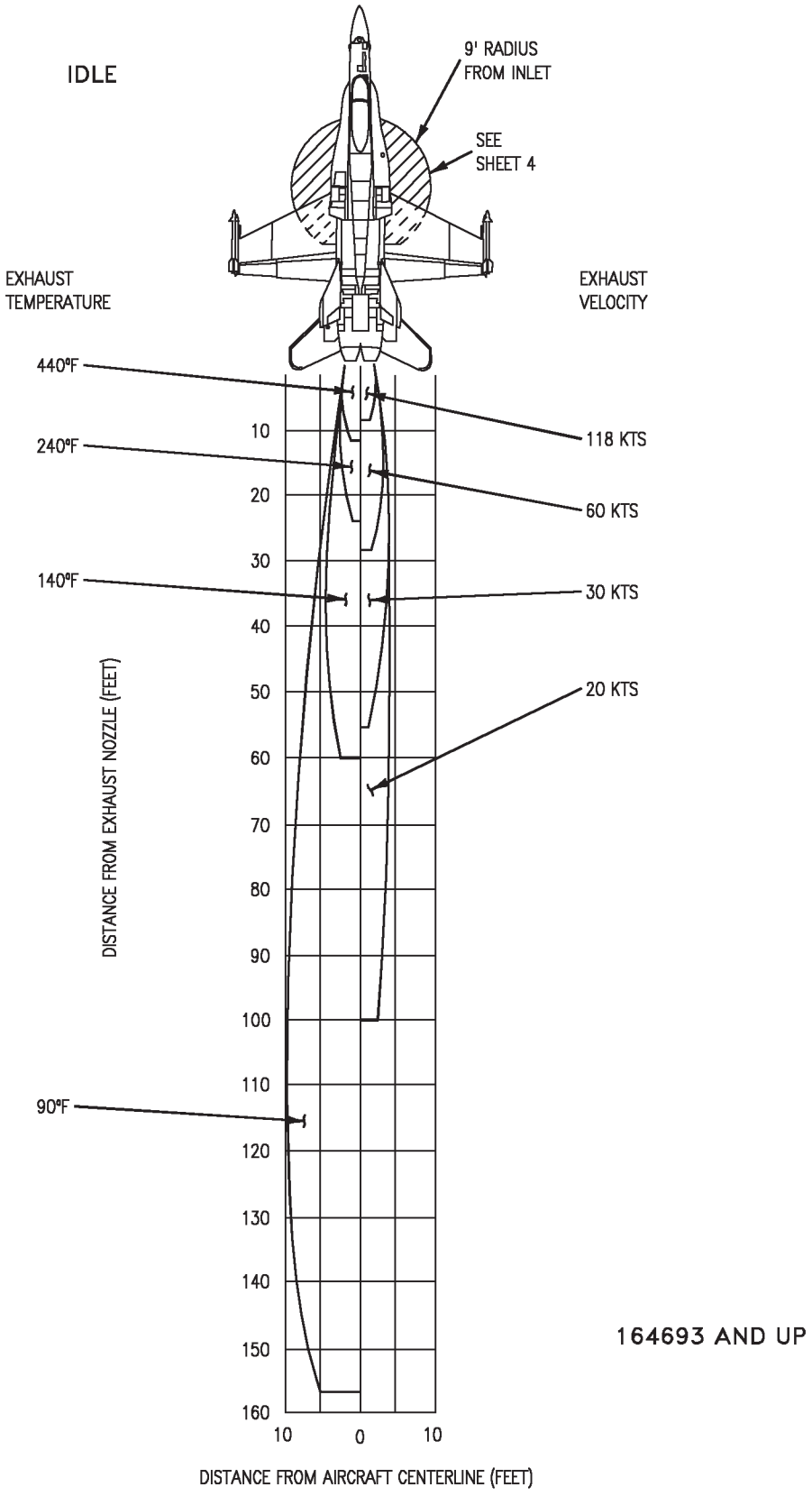


Figure 4. Engine Danger Areas (Sheet 5)

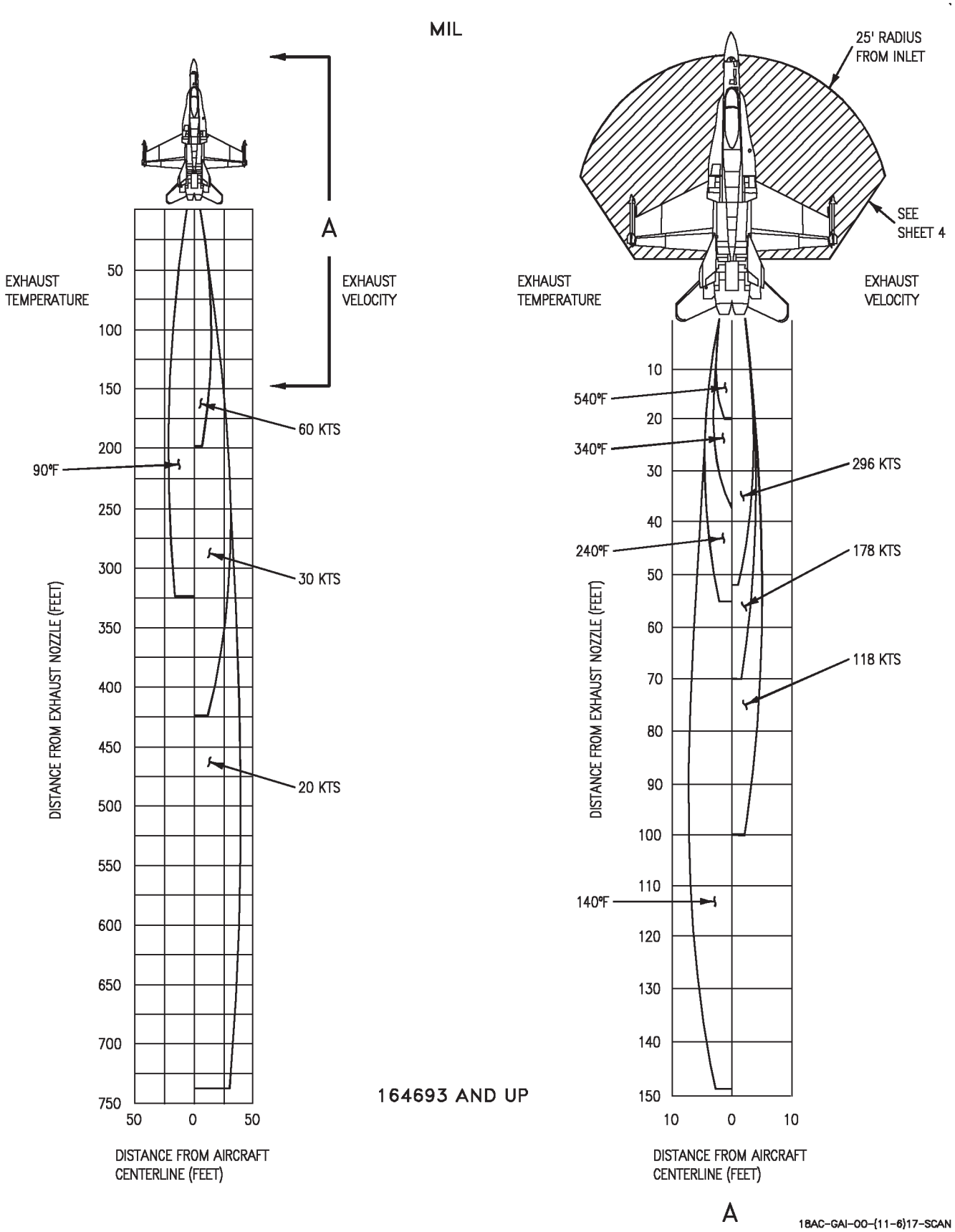
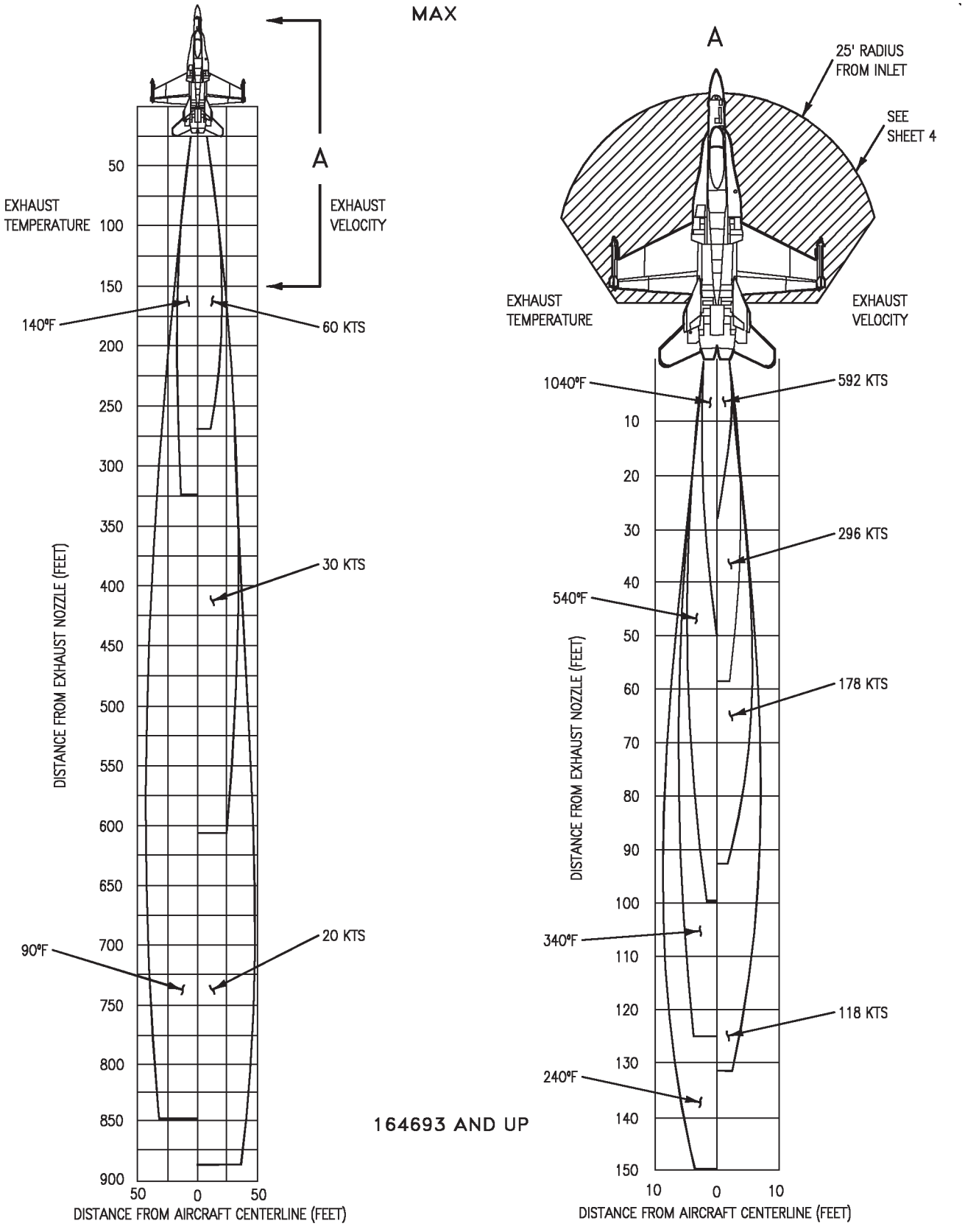
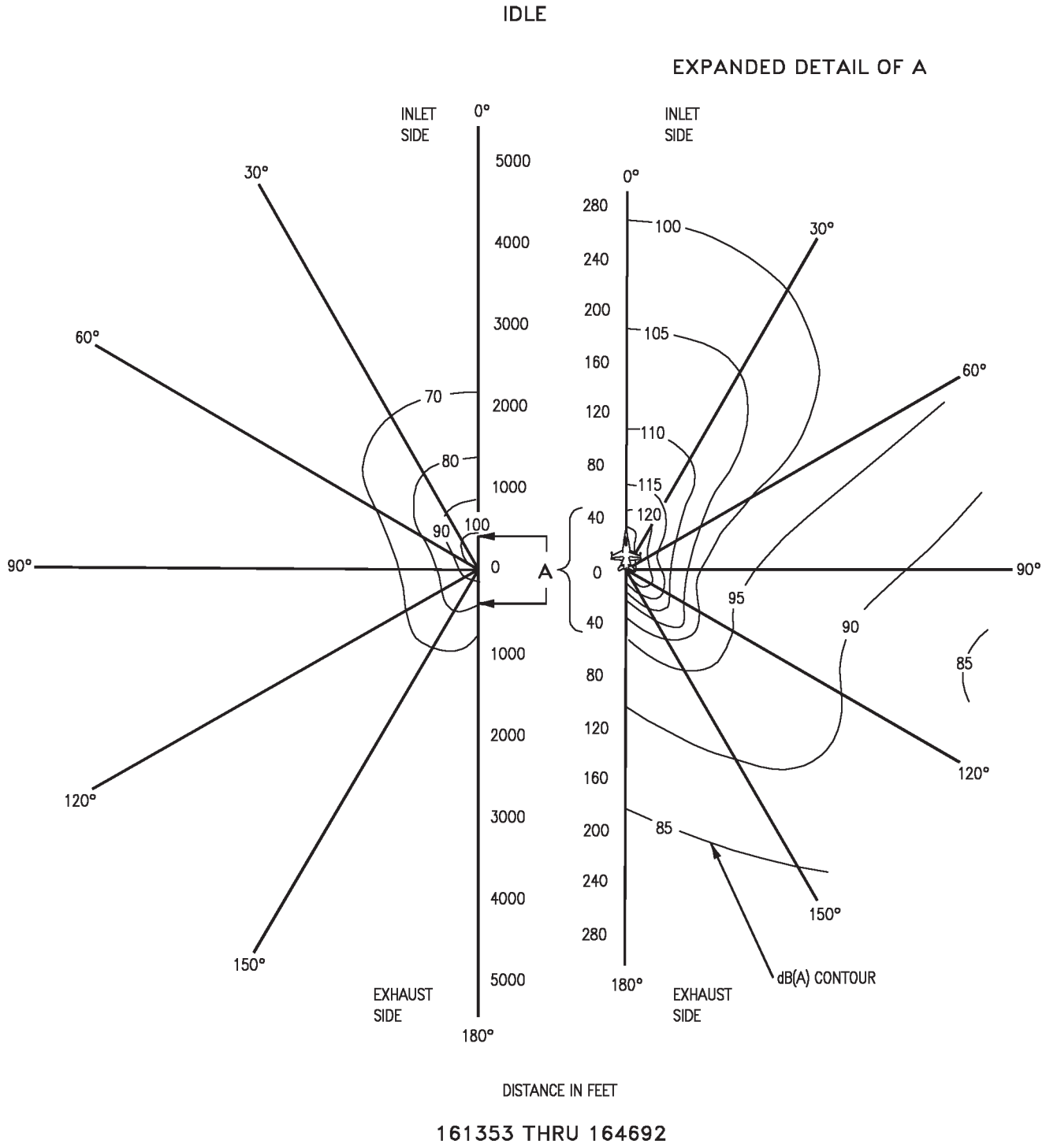


Figure 4. Engine Danger Areas (Sheet 6)



18AC-GAI-00-(11-7)17-SCAN

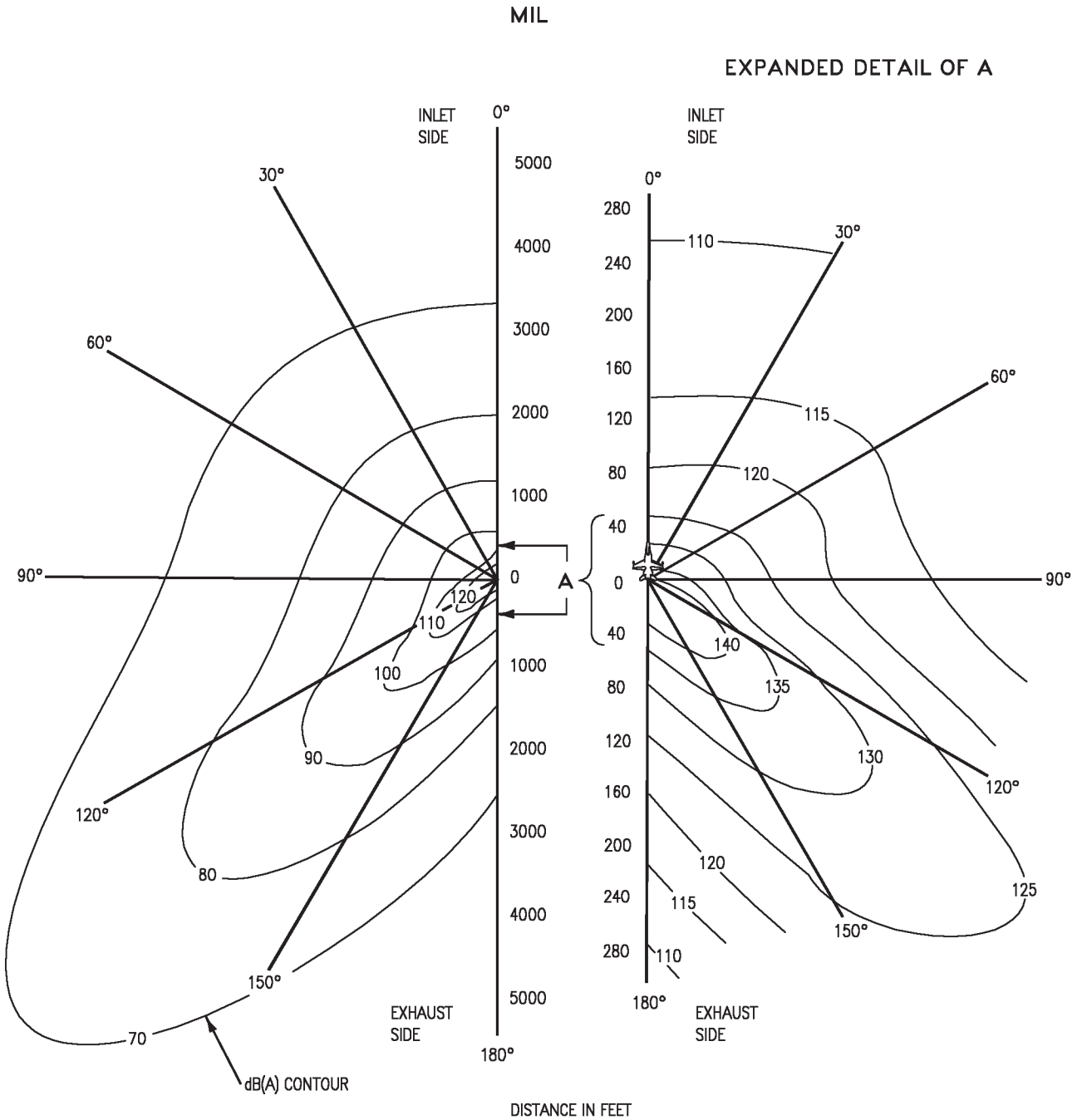
Figure 4. Engine Danger Areas (Sheet 7)



161353 THRU 164692

18AC-GAI-00-(10-1)17-CATI

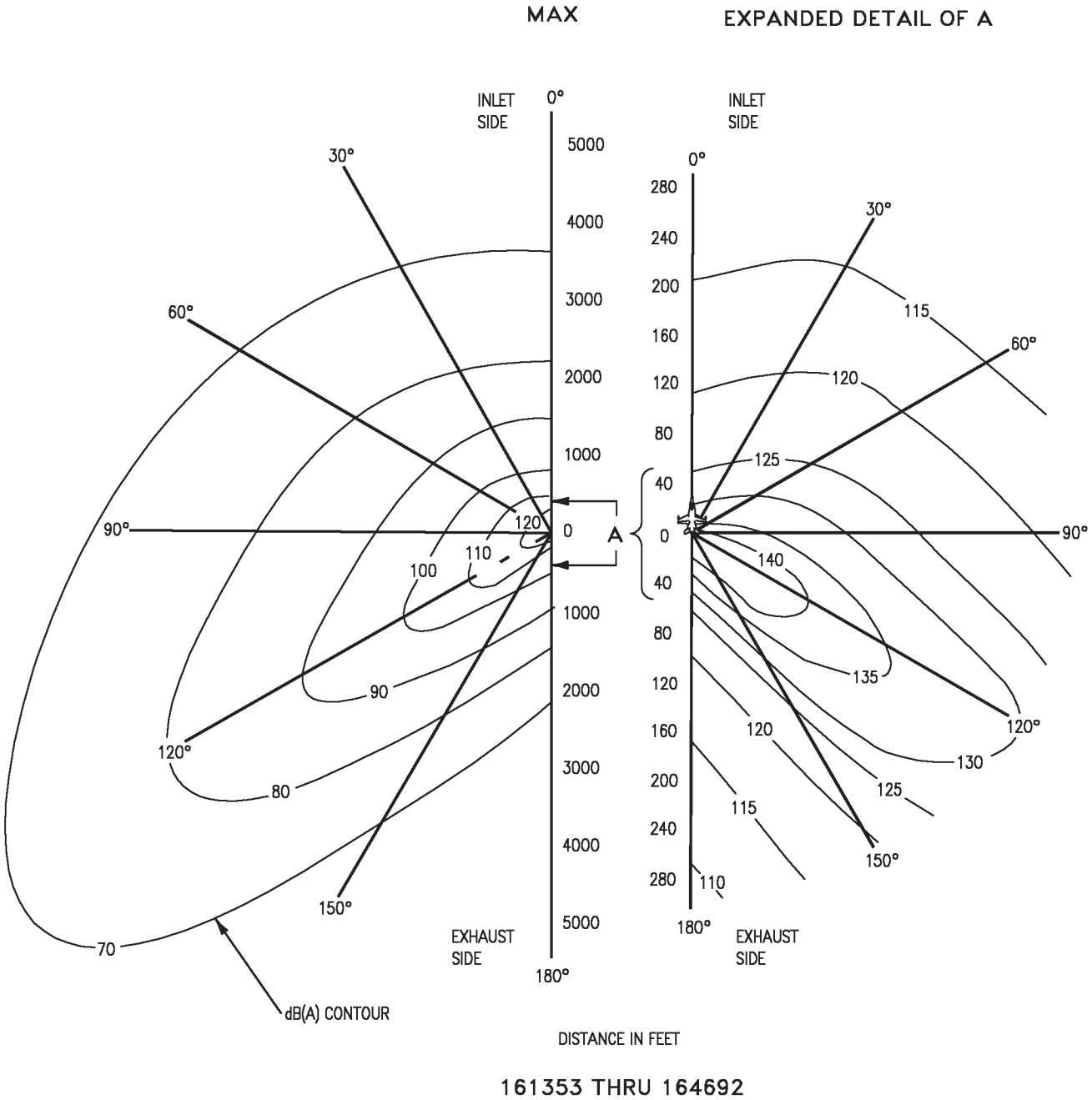
Figure 5. Engine Noise Hazard (Sheet 1)



161353 THRU 164692

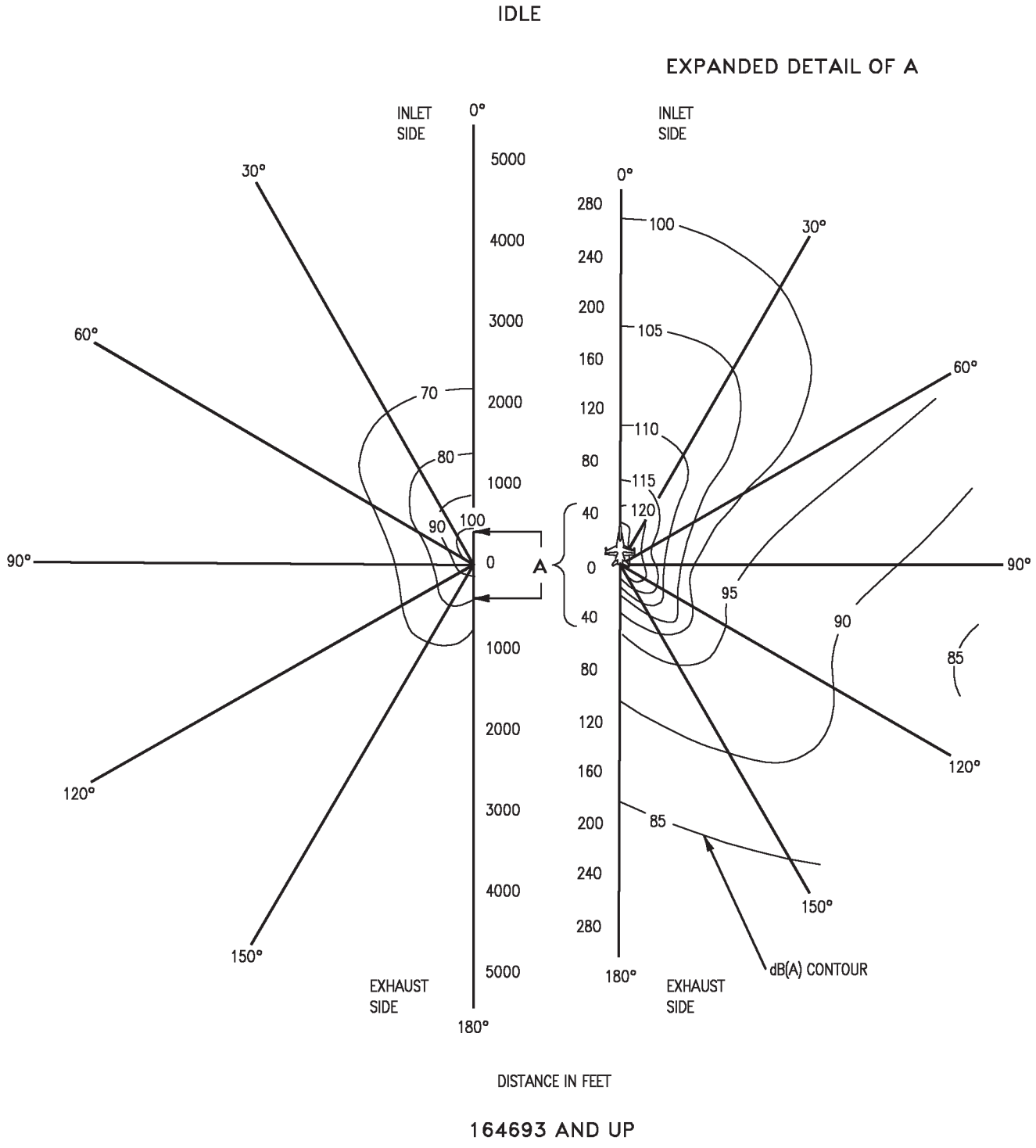
18AC-GAI-00-(10-2)17-CATI

Figure 5. Engine Noise Hazard (Sheet 2)



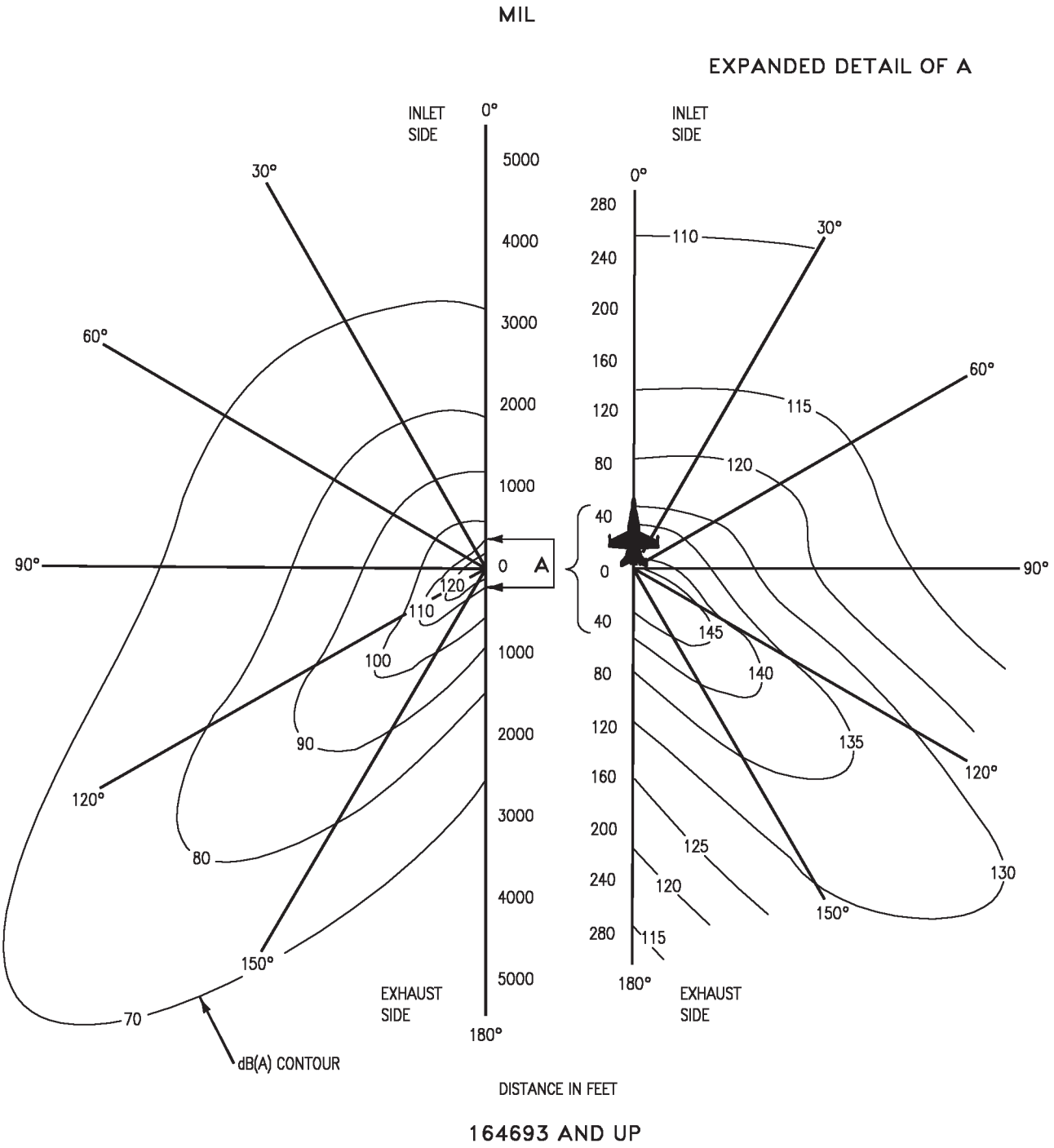
18AC-GAI-00-(10-3)17-CATI

Figure 5. Engine Noise Hazard (Sheet 3)



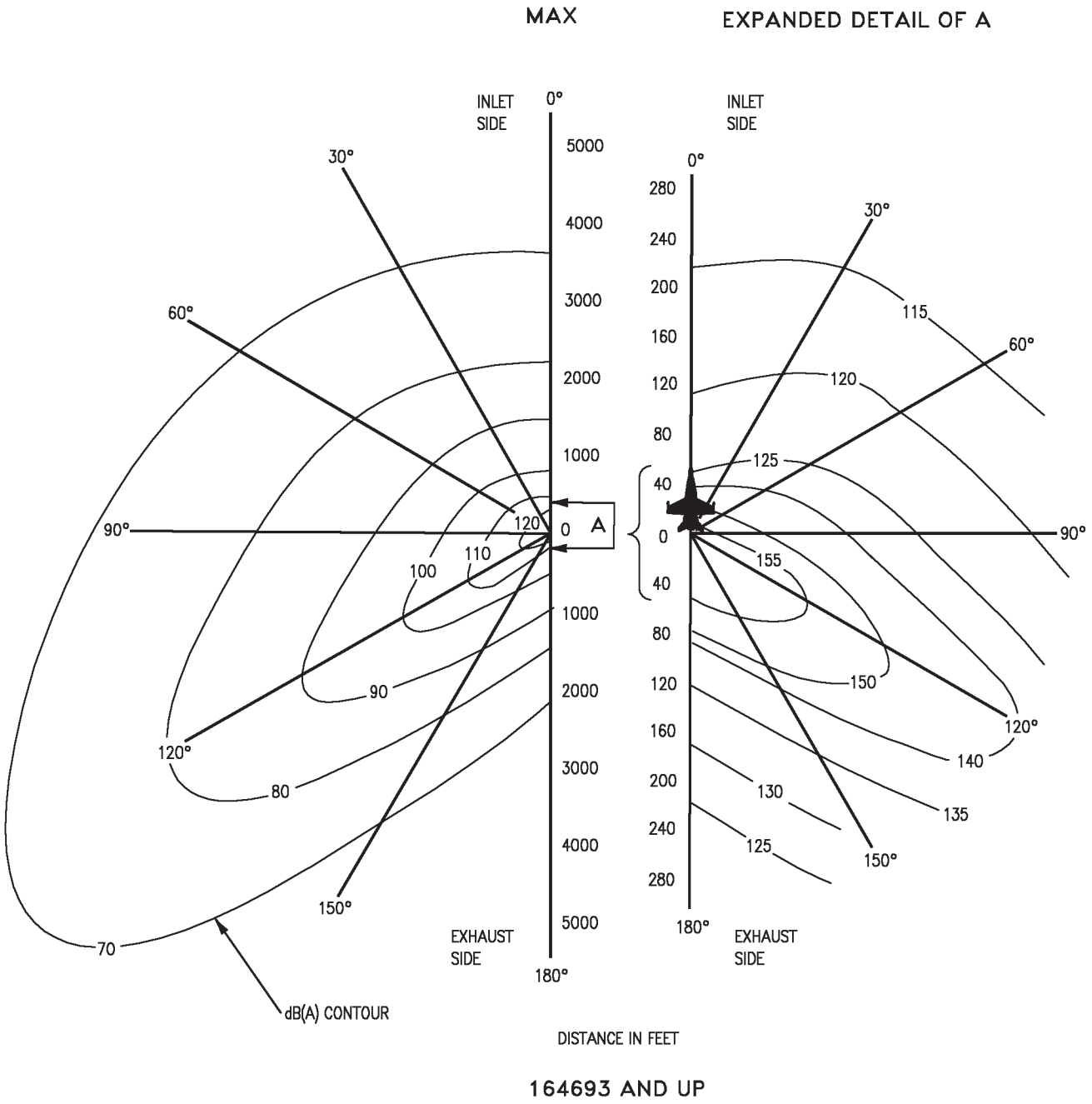
18AC-GAI-00-(10-4)17-CATI

Figure 5. Engine Noise Hazard (Sheet 4)



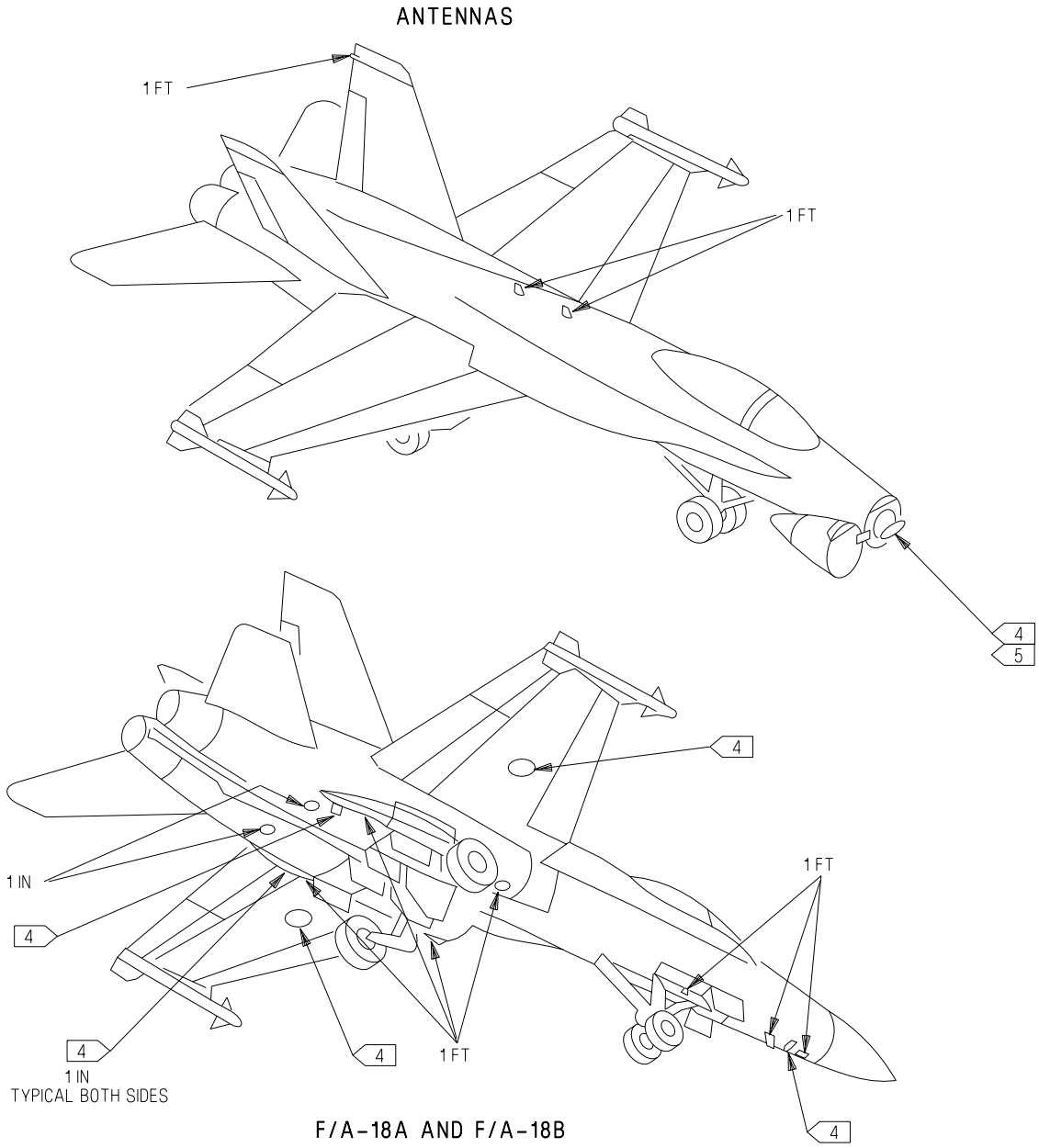
18AC-GAI-00-(10-5)17-CATI

Figure 5. Engine Noise Hazard (Sheet 5)



18AC-GAI-00-(10-6)17-CATI

Figure 5. Engine Noise Hazard (Sheet 6)



LEGEND

1. SAFE CLEARANCE SHOWN ARE BASED ON FIELD POWER DENSITY OF 100W M .

2. UNLABELED ANTENNAS DO NOT EMIT ELECTROMAGNETIC RADIATION.

3. RADAR DOES NOT NORMALLY TRANSMIT WHEN WEIGHT IS ON WHEELS.

4 ANTENNAS WHICH DO NOT NORMALLY TRANSMIT WHEN WEIGHT IS ON WHEELS.

5 STAY 3 FEET CLEAR WHEN RADOME IS OPEN.

6 1 FOOT RADIUS WITH ALQ-126B INSTALLED
12 FOOT RADIUS WITH ALQ-165 INSTALLED
SYSTEM DOES NOT NORMALLY TRANSMIT
WITH WEIGHT ON WHEELS.

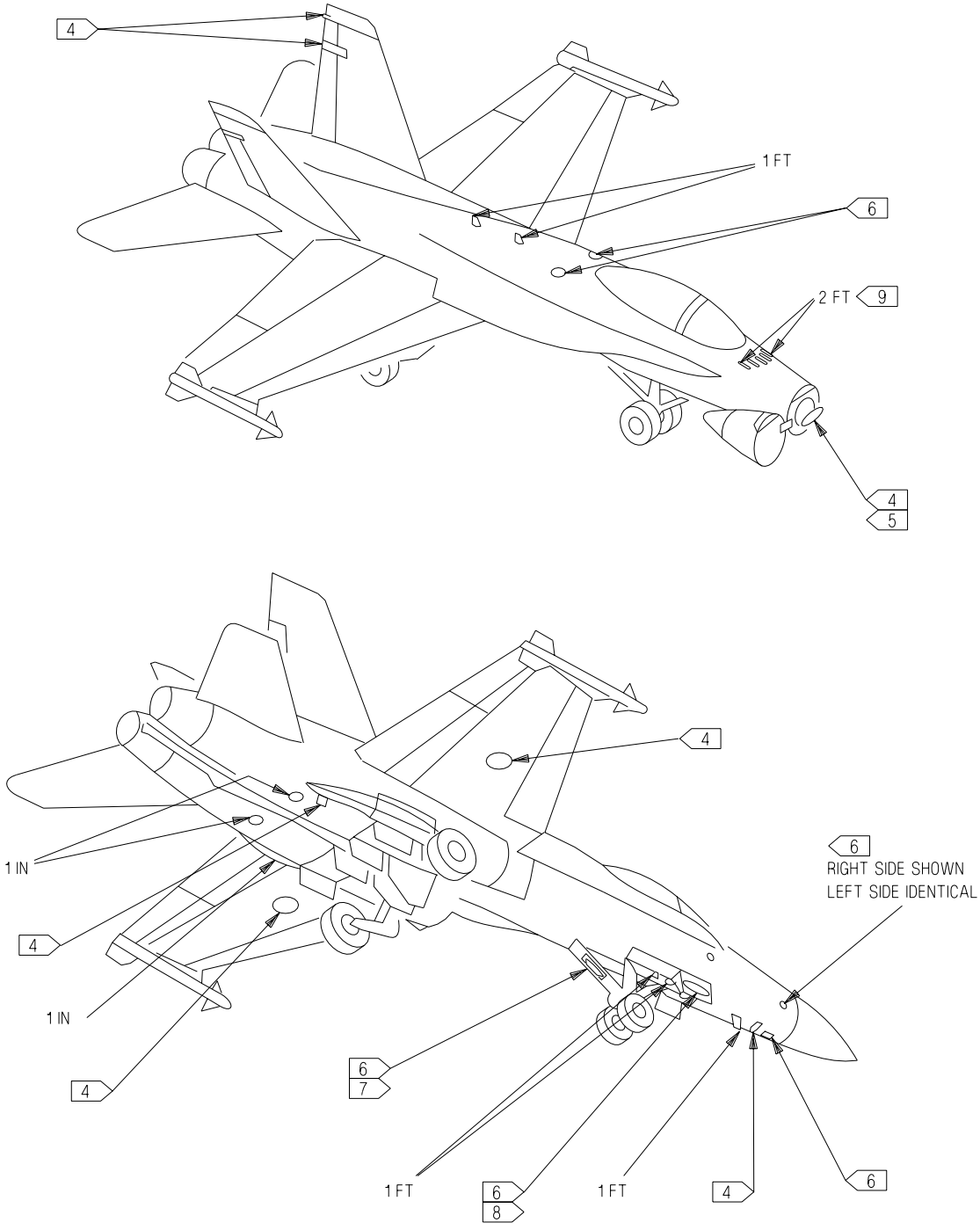
7 F/A-18D 164279 AND UP.

8 F/A-18C, AND F/A-18D 163434 THRU 164272.

9 165222 AND UP; ALSO 162394 THRU 163175 AFTER F/A-18 AFC 292 AND 163985 THRU 165221 AFTER F/A-18 AFC 236.

ADA540-12-1-030

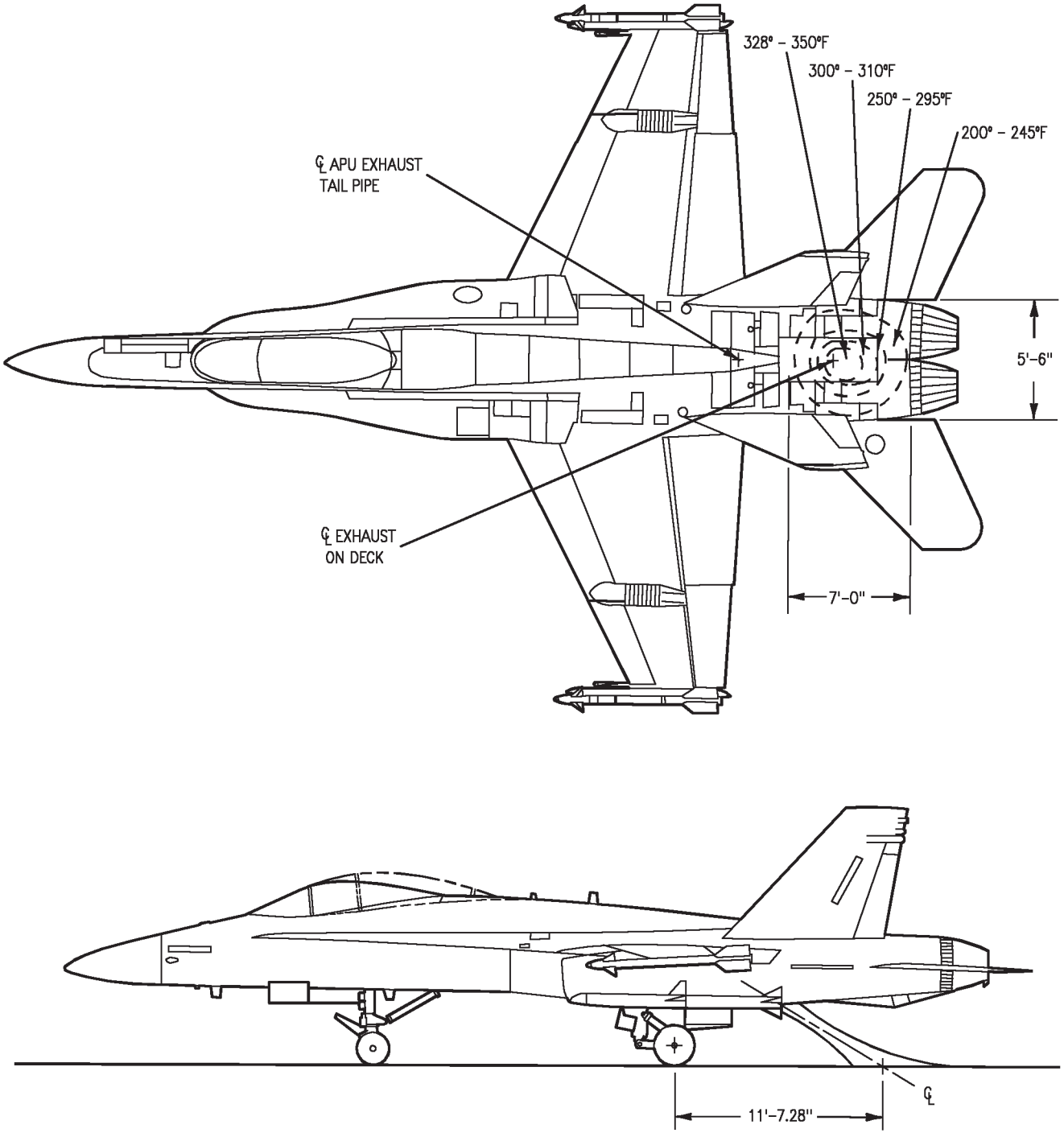
Figure 6. Radiation Danger Areas/Minimum Safe Distances (Sheet 1)



F/A-18C AND F/A-18D

ADA540-12-2-25

Figure 6. Radiation Danger Areas/Minimum Safe Distances (Sheet 2)



LEGEND

1. ESTIMATED VELOCITY AT:

CENTER OF FOOTPRINT: 142 MPH.
13" DIA CIRCLE – 71 MPH.
19" DIA CIRCLE – 24 MPH.

18AC-GAI-00-(15-1)-SCAN

Figure 7. APU Danger Area